2(b)

SUPPLEMENTAL

GENERAL CONDITIONS

SUPPLEMENTAL GENERAL CONDITIONS

DEFINITIONS

Wherever the word "Engineer" is used herein, it shall be and is mutually understood to refer to the Engineer representing Canton Drop Forge (CDF) or his duly authorized representative or agent, limited by the particular duties entrusted to them.

Wherever the word "Contractor" is used herein, it shall be and is mutually understood to refer to the Party, or Parties, contracting to perform the work to be done under this contract, or the legal representatives of such Party or Parties, including all Subcontractors.

Wherever the word "Owner" is used herein, it shall be understood to refer to Canton Drop Forge, or to the duly authorized representative thereof.

NON-DISCRIMINATION IN EMPLOYMENT

The Contractor agrees that in the hiring of employees for the performance of work under this Contract or any subcontractor, neither the Contractor, nor any subcontractor, nor any person acting on behalf of either, shall discriminate against any applicant for employment of labor or workers who are qualified and available to perform the work to which the employment relates on account of race, color, religion, sex, handicap, or national origin; nor shall the Contractor, or any subcontractor, or any person acting on behalf of either, in any manner discriminate against or intimidate any employee hired for the performance of work under this Contract.

REFERENCE STANDARDS

Reference to the standards or specifications of any technical society, organization or association, shall mean the latest standard or specification adopted and published 60 days prior to the date of taking bids, unless specifically stated otherwise.

OHIO DEPARTMENT OF TRANSPORTATION SPECIFICATIONS

The Construction and Material Specifications of the Ohio Department of Transportation (ODOT) shall apply where noted on the plans and/or specifications. Each item or section referred to in the ODOT specifications shall have the same effect, application, and force as if produced in their entirety herein.

Notice should be taken that the specifications to be used for the method of construction installation, the acceptance of the referenced item(s), and the unit of measure to be used for payment purpose may or may not correspond to that used by ODOT.

Where a specification contained herein modifies the ODOT specifications or a section thereof, the modification shall prevail without altering the force and application of the remaining section of the ODOT specifications.

TECHNICAL DATA

The result of the bioremediation project shall be to reduce the TPH levels of the sludge removed from the lagoons to less than 380 ppm. The contractor shall also "seed" both lagoon linings immediately after removal of the contaminated sludge to enhance the natural biological activity in the remaining lagoons.

EXTRA WORK

Extra work, when deemed necessary, may be ordered by the Engineer. When extra work items are not stipulated in the estimated quantities or compensation covered under unit prices, the amount to be paid for extra work shall be agreed upon by both the Contractor and CDF. The additional compensation for extra work shall be approved by CDF, as a supplement to the contract, prior to undertaking the work.

DELIVERY AND RECEIPT OF MATERIALS

CDF will not accept responsibility for the delivery and receipt of any items of equipment or materials.

Contractors supplying equipment or materials for this project shall make arrangements to have men available at the site to receive this equipment or materials when delivered.

Contractors shall make arrangements with CDF for storage of materials and equipment. They shall not use any portion of the street right-of-way for storage of material and equipment. Satisfactory protection against fire and theft shall be maintained for stored material and equipment by the Contractor.

PROTECTION OF WORK AND PROPERTY

The Contractor shall at all times safely guard CDF property from injury or loss in connection with this contract. He shall at all times safely guard and protect his own work and that of adjacent property from damage. All guard fences or barricades, lights and other facilities as required for protection by laws, regulations, local conditions and these specifications must be provided and maintained.

Any damage to new and existing, materials, work, structures, etc., shall be repaired or replaced to the satisfaction of CDF at the Contractor's expense.

Any existing or new work damaged by failure to provide protection for same shall be removed and replaced or repaired with new work at the Contractor's expense.

Any existing utilities damaged during construction shall be repaired or replaced by the Contractor to original condition at no expense to CDF.

PROTECTION OF PERSONS AND SAFETY

The Contractor is advised that during the construction of the project, the owners and operators of adjacent premises will occupy and operate their respective premises and carry on their everyday activities. It is the responsibility of the Contractor to conduct and schedule his work so as to cause the least interference to those everyday activities and to prevent undue noise and disturbance to the inhabitants of the buildings.

The Contractor shall provide, construct, maintain and remove all temporary barriers required for protection of persons and vehicles using adjacent buildings, all in accordance with state and local building codes and OSHA requirements.

All Contractors are reminded that all work must be in accordance with all local, state, and federal standards. In addition, the work is to be conducted in strict accordance with the Occupational Safety and Health Act of 1970 (OSHA), U.S. Department of Labor, including all subsequent amendments and additions, to provide safety and health protection for workers. The General Contractor shall be in charge of ascertaining that all other contractors connected with the project conform with the current (OSHA) safety and health regulations.

ESTIMATES FOR PAYMENT AND RETAINER

Contractor may submit an estimate of the amount and value of material in place and work done at any time during the contract, but not more often than once every 30 days. Partial payment to the Contractor for work performed or materials installed shall be based on an estimate, agreed to by both Contractor and Engineer, of the percent of work complete.

A retainer of ten percent (10%) shall be withheld from Contractors invoices until the contract is complete. Entire amount of retainer shall be paid to the Contractor upon approval of final invoice indicating satisfactory completion of all work.

No partial payment shall be construed as an acceptance, by the Engineer of any materials furnished or work done. Any or all estimates may be withheld indefinitely by CDF until the terms of this contract have been complied with by the Contractor.

INCIDENTAL WORK

All work to be done by the Contractor, specified or mentioned in the plans or specifications, as well as any minor details of the work not specifically mentioned but obviously necessary for the proper completion of the work, shall be included in the bid price. The Contractor will not be entitled to any extra or additional compensation for the same.

SECTION 01039

COORDINATION AND MEETINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Coordination.

B. Field engineering.

C. Preconstruction meeting.

E. Progress meetings.

1.2 COORDINATION

A. Coordinate scheduling, submittals, and Work of the various sections of the Project Manual to assure efficient and orderly sequence of installation of interdependent construction elements.

B. Verify utility requirements and characteristics of operating equipment are compatible with existing utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

C. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.3 FIELD ENGINEERING

A. Employ a Land Surveyor registered in the State of Ohio and acceptable to Owner.

B. Contractor to locate and protect survey control and reference points.

C. Control datum for survey is that shown on Drawings.

D. Verify set-backs and easements, confirm drawing dimensions and elevations.

E. Provide field engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.

1.4 PRECONSTRUCTION MEETING

A. Owner will schedule a meeting after Notice of Award.

B. Attendance Required: Owner, Engineer, and Contractor.

C. Agenda:
1. Execution of Owner-Contractor Agreement.
2. Submission of executed bonds and insurance certificates.
3. Distribution of Contract Documents.
4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
5. Designation of personnel representing the parties in Contract, and the Engineer.
6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
7. Scheduling.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Engineer, Owner, participants, and those affected by decisions made.

1.5 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at maximum monthly intervals.

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Engineer, as appropriate to agenda topics for each meeting.

D. Agenda:
1. Review minutes of previous meetings.
2. Review of Work progress.
3. Field observations, problems, and decisions.
4. Identification of problems which impede planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of off-site fabrication and delivery schedules.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.

11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.
13. Other business relating to Work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Engineer, Owner, participants, and those affected by decisions made.

1.6 PREINSTALLATION MEETING

A. When required in individual specification sections, convene a preinstallation meeting at work site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Engineer four days in advance of meeting date.

D. Prepare agenda and preside at meeting:
1. Review conditions of installation, preparation and installation procedures.
2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Engineer, Owner, participants, and those affected by decisions made.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Submittal procedures.

B. Construction progress schedules.

C. Proposed Products list.

D. Shop Drawings.

E. Product Data.

F. Samples.

G. Manufacturer's installation instructions.

H. Manufacturers' certificates.

I. Construction photographs.

1.2 RELATED SECTIONS

A. Section 01700 - Contract Closeout: Contract, manufacturers' certificates, and closeout submittals.

1.3 SUBMITTAL PROCEDURES

A. Transmit each submittal with Engineer accepted form.

B. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate.

C. Apply Contractor's stamp, signed or initialled certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.

D. Schedule submittals to expedite the Project, and deliver to Engineer at Hammontree & Associates, Limited, 5233 Stoneham Road, North Canton, Ohio 44720. Coordinate submission of related items.

F. For each submittal for review, allow 10 days excluding delivery time to and from the contractor.

G. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.

H. Provide space for Contractor and Engineer review stamps.

I. Revise and resubmit, identify all changes made since previous submission.

J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with provisions.

K. Submittals not requested will not be recognized or processed.

1.4 CONSTRUCTION PROGRESS SCHEDULES

A. Submit initial schedule in duplicate within 15 days after date established in Notice to Proceed.

B. Revise and resubmit as required.

C. Submit revised schedules with each Application for Payment, identifying changes since previous version.

F. Indicate estimated percentage of completion for each item of Work at each submission.

G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and required by Allowances.

1.5 PROPOSED PRODUCTS LIST

A. Within 15 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.6 SHOP DRAWINGS

A. Submit the number of opaque reproductions which Contractor requires, plus two copies which will be retained by Engineer.

B. Shop Drawings: Submit for review. After review, produce copies and distribute in accordance with the SUBMITTAL PROCEDURES article above and for record documents purposes described in Section 01700 - CONTRACT CLOSEOUT.

1.7 PRODUCT DATA

A. Submit the number of copies which the Contractor requires, plus two copies which will be retained by the Engineer.

B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.

D. After review distribute in accordance with the Submittal Procedures article above and provide copies for record documents described in Section 01700 - CONTRACT CLOSEOUT.

1.8 MANUFACTURER INSTALLATION INSTRUCTIONS

A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, adjusting, and finishing, to Engineer in quantities specified for Product Data.

B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.9 MANUFACTURER CERTIFICATES

A. When specified in individual specification sections, submit certification by manufacturer to Engineer, in quantities specified for Product Data.

B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Engineer.

SCHEDULE OF WORK

The Contractor shall notify the Engineer and CDF 24 hours in advance of moving men, equipment or materials on the site and/or the initiation of any work, so the Engineer and CDF can arrange for inspection services.

CLEANING UP

Project area shall be kept free of waste materials accumulated by reason of work on the project. All packaging devices such as cartons, boxes, wrapping paper, etc., brought to the premises in connection with the work are to be removed as the work progresses. The premises shall be kept neat and orderly at all times. All materials, equipment and other debris shall be removed from the premises upon completion of each work day. Any public or private property which may have been damaged during construction by use or storage of materials and equipment shall be restored by the Contractor to the satisfaction of the Engineer.

SAFETY AND PROTECTION:

CONTRACTOR shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

All persons on the Work site or who may be affected by the Work.

All the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and

Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Facilities not designated for removal, relocation or replacement in the course of construction.

CONTRACTOR shall comply with all applicable Laws and Regulations of any public body having jurisdiction for safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property. All damage, injury or loss to any property referred to under SAFETY AND PROTECTION herein caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or

Specifications or to the acts or omissions of OWNER or ENGINEER or ENGINEER's Consultant or anyone employed by any of them or anyone for whose acts any of them May be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR or any Subcontractor, Supplier or their person or organization directly or indirectly employed by any of them). CONTRACTOR's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

SAFETY REPRESENTATIVE:

CONTRACTOR shall designate a qualified and experienced safety representative at the site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervision of safety precautions and programs.

HAZARD COMMUNICATION PROGRAMS:

CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the site in accordance with Laws or Regulations.

EMERGENCIES:

In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, CONTRACTOR, without special instruction or authorization from OWNER or ENGINEER, is obligated to act to prevent threatened damage, injury or loss. CONTRACTOR shall give ENGINEER prompt written notice if CONTRACTOR believes that any significant changes in Work or variations from the Contract Documents have been caused thereby. If ENGINEER determines that a change in the Contract Documents is required because of the action taken by CONTRACTOR in response to such an emergency, a Work Change Directive or Change Order will be issued to document the consequences of such action.

LIMITATIONS ON ENGINEER'S RESPONSIBILITIES:

Neither Engineer's authority to act under the preceding articles or elsewhere in the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of Engineer to Contractor, any Subcontractor, any manufacturer, fabricator, supplier or distributor, or any of their agents or employees or any other person performing any of the Work.

DETAILED

SPECIFICATIONS

INSURANCE

SPECIFICATIONS

INSURANCE SPECIFICATIONS

The Contractor and all Subcontractors (hereinafter called the "Contractor") shall provide and maintain during the life of this contract the following minimum insurance, limits, and conditions:

COMPREHENSIVE GENERAL LIABILITY

The Comprehensive General Liability Coverage shall include Completed Operations -- Products Coverage, Personal Injury Coverage, and Contractual Liability Coverage.

The Comprehensive General Liability Coverage shall include Underground Hazards for sub-surface operations. Explosion and Collapse Liability coverage shall be determined by Canton Drop Forge (CDF) on the basis of specific construction exposures.

The minimum limits of liability shall be as follows, unless otherwise specifically required by special provisions in the specifications or this Contract.

AMOUNT OF CONTRACT:	**UNDER $50,000**	**OVER $50,000**
Bodily Injury Liability -		
Each Occurrence	$300,000	$1,000,000
Aggregate	$300,000	$1,000,000
Property Damage Liability -		
Each Occurrence	$100,000	$250,000
Aggregate	$100,000	$250,000

COMPREHENSIVE AUTOMOBILE LIABILITY

The Comprehensive Automobile Liability Coverage shall include Owned, Non-Owned, and Hired Coverage.

The minimum limits of liability shall be as follows, unless otherwise specifically required by special provisions in the specifications or this Contract:

AMOUNT OF AGREEMENT:	**UNDER $50,000**	**OVER $50,000**
Bodily Injury Liability -		
Each Person	$100,000	$1,000,000
Each Occurrence	$300,000	$1,000,000
Property Damage Liability -		
Each Occurrence	$100,000	$250,000

Any combination of underlying Comprehensive General/Automobile Liability coverage with Umbrella/Excess Liability coverage which provides the required Bodily Injury and Property Damage Liability coverages will be acceptable.

ERRORS & OMISSION INSURANCE

The Consultant shall carry and keep in full force and effect during the life of this Agreement professional liability insurance in an amount not less than One Million Dollars ($1,000,000.00) for damages resulting from negligent acts, errors, or omissions in the professional services rendered by the Consultant under this Agreement. The Consultant shall give the Owner sixty (60) days written notice of cancellation or discontinuance of the policy up through the one year maintenance period after completion of construction. The Consultant shall add CDF as an additional insured.

CERTIFICATE OF INSURANCE

The Contractor shall file a Certificate of Insurance for all coverages required in these insurance specification on the ACORD 25 form (preferred), with CDF before starting work on this project, and shall keep such certificates current and on file with CDF for the life of this Contract.

SUBCONTRACTORS

The Insurance Specifications apply equally to all subcontractors.

NOTICE TO PROCEED

The Contractor shall not commence work under this contract until he has obtained all the insurance required herein, has submitted appropriate Certificates of Insurance to and received approval of CDF as evidenced by a Notice to Proceed.

WORKERS' COMPENSATION

The Contractor shall comply with the Ohio Workers' Compensation Act, and he shall relieve and protect CDF from any costs due to accidents or other liabilities mentioned in said Act. At the time of delivery of this contract and at such other times as may be requested, the contractor shall furnish official certificates or receipts showing compliance with the Act. If, for any reason employees engaged in the work of this Contract are not or cannot be protected directly under Workers' Compensation Act, the Contractor shall provide other and adequate compensation insurance for such employees together with proof thereof.

In case any of the work is sublet, the Contractor shall require the subcontractor to provide compensation insurance for those employees who are not covered by the Contractor himself, and he shall furnish evidence that such insurance is provided.

The Contractor shall not perform any work on this Contract until he has filed a copy of his current Workers' Compensation Certificate with CDF.

1.10 CONSTRUCTION PHOTOGRAPHS

A. Each month submit photographs with Application for Payment.

B. Photographs: Two prints; color, 3 x 5 inch size; mounted on 8-1/2 x 11 paper, with left edge binding margin for three hole punch.

C. Take a minimum of 5 site photographs from differing locations indicating the relative progress of the Work, 5 days maximum prior to submitting.

D. Identify photographs with date, time, orientation, and project identification.

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Quality assurance - control of installation.

B. Tolerances

C. References.

F. Manufacturers' field services and reports.

1.2 RELATED SECTIONS

A. Section 01300 - Submittals: Submission of manufacturers' instructions and certificates.

B. Section 01600 - Material and Equipment: Requirements for material and product quality.

1.3 QUALITY ASSURANCE - CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform work by persons qualified to produce workmanship of specified quality.

F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.4 TOLERANCES

A. Monitor tolerance control of installed Products to produce acceptable Work. Do not permit tolerances to accummulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.

C. Adjust Products to appropriate dimensions; position before securing Products in place.

1.5 REFERENCES

A. For Products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date of Contract Documents date except where a specific date is established by code.

C. Obtain copies of standards where required by product specification sections.

D. The contractual relationship, duties, and responsibilities of the parties in Contract nor those of the Engineer shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.7 INSPECTING AND TESTING LABORATORY SERVICES

A. Owner will appoint, employ, and pay for specified services of an independent firm to perform inspecting and testing.

B. The independent firm will perform inspections, tests, and other services specified in individual specification sections and as required by the Engineer or the Owner.

C. Inspecting, testing, and source quality control may occur on or off the project site. Perform off-site inspecting or testing as required by the Engineer or the Owner.

D. Reports will be submitted by the independent firm to the Engineer in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
   1. Notify Architect/Engineer and independent firm 24 hours prior to expected time for operations requiring services.
   2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.

F. Testing or inspecting does not relieve Contractor to perform Work to contract requirements.

G. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Engineer. Payment for retesting will be charged to the Contractor by deducting inspecting or testing charges from the Contract Sum/Price.

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Temporary Utilities: Electricity, telephone service, water, and sanitary facilities.

B. Temporary Controls: Barriers, enclosures and fencing, protection of the Work, and water control.

C. Construction Facilities: Access roads, parking, progress cleaning, project signage, and temporary buildings.

1.2 RELATED SECTIONS

A. Section 01700 - Contract Closeout: Final cleaning.

1.3 TEMPORARY ELECTRICITY

A. Cost: By Contractor; provide and pay for power service required from source.

B. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.

E. Provide main service disconnect and overcurrent protection at convenient location.

F. Permanent convenience receptacles may not be utilized during construction.

1.4 TELEPHONE SERVICE

A. Provide, maintain and pay for telephone service to field office at time of project mobilization.

1.5 TEMPORARY WATER SERVICE

A. Provide, maintain and pay for suitable quality water service required for construction operations.

B. Owner will pay cost of water used. Exercise measures to conserve water.

C. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

1.6 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures.

1.7 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction and to protect existing facilities and adjacent properties from damage from construction operations.

B. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.8 WATER CONTROL

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

1.9 PROTECTION OF INSTALLED WORK

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.

C. Prohibit traffic from landscaped areas.

1.10 SECURITY

A. Provide security and facilities to protect Work from unauthorized entry, vandalism, or theft.

1.11 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Collect and remove waste materials, debris, and rubbish from site periodically and dispose off-site.

1.12 PROJECT IDENTIFICATION

A. Provide 8 foot wide x 6 foot high project sign of exterior grade plywood and wood frame construction, painted, to Engineer's design and colors.

B. List title of Project, names of Owner, Engineer, professional sub-consultants, Contractor, and major Subcontractors.

C. Erect on site at location established by Engineer.

D. No other signs are allowed without Owner permission except those required by law.

1.13 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion Final Application for Payment inspection.

B. Clean and repair damage caused by installation or use of temporary work.

C. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

END OF SECTION

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Products.

B. Transportation and handling.

C. Storage and protection.

D. Product options.

E. Substitutions.

1.2 RELATED SECTIONS

A. Instructions to Bidders: Product options and substitution procedures.

B. Section 01400 - Quality Control: Product quality monitoring.

1.3 PRODUCTS

A. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

1.4 TRANSPORTATION AND HANDLING

A. Transport and handle Products in accordance with manufacturer's instructions.

B. Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.

C. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.5 STORAGE AND PROTECTION

A. Store and protect Products in accordance with manufacturers' instructions, with seals and labels intact and legible.

B. For exterior storage of fabricated Products, place on sloped supports, above ground.

C. Provide off-site storage and protection when site does not permit on-site storage or protection.

D. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation or potential degradation of Product.

E. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

F. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.

G. Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

1.6 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article.

1.7 SUBSTITUTIONS

A. Instructions to Bidders specify time restrictions for submitting requests for Substitutions during the bidding period to requirements specified in this section.

B. Substitutions may be considered when a Product becomes unavailable through no fault of the Contractor.

C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

D. A request constitutes a representation that the Contractor:
   1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.
   2. Will provide the same warranty for the Substitution as for the specified Product.
   3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension which may subsequently become apparent.
   5. Will reimburse Owner and Engineer for review or redesign services associated with re-approval by authorities.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure:
   1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
   2. Submit shop drawings, product data, and certified test results attesting to the proposed Product equivalence. Burden of proof is on proposer.
   3. The Engineer will notify Contractor in writing of decision to accept or reject request.

END OF SECTION

1.5 ADJUSTING

A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.6 PROJECT RECORD DOCUMENTS

A. Maintain on site, one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed Shop Drawings, Product Data, and Samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish main floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Field changes of dimension and detail.
   5. Details not on original Contract drawings.

G. Remove Engineer title block and seal from all documents.

H. Submit documents to Engineer with claim for final Application for Payment.

1.8 WARRANTIES

A. Provide duplicate notarized copies.

B. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.

C. Provide Table of Contents and assemble in binder with cover.

D. Submit prior to final Application for Payment.

E. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

END OF SECTION

SECTION 02200
EXCAVATING, BACKFILLING, AND COMPACTING

PART 1 GENERAL

1.1 DESCRIPTION

A. Work included: Excavate, backfill, compact, and grade the site to the elevations shown on the Drawings, as specified herein, and as needed to meet the requirements of the construction shown in the Contract Documents.

B. Related Work:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   2. Section 02010: Soils report and soil engineer.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Use equipment adequate in size, capacity, and numbers to accomplish the work of this Section in a timely manner.

C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the soil engineer.

1.3 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01640.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. Fill and Backfill materials
   1. Provide soil materials free from organic matter and deleterious substances, containing no rocks or lumps over 6" in greatest dimension, and with not more than 15% of the rocks or lumps larger than 2-3/8" in their greatest dimension.
   2. Fill material is subject to the approval of the soil engineer, and is that material removed from excavations or imported from off-site borrow areas,

predominately granular, non-expansive soils free from roots and other deleterious matter.

3. Do not permit rocks having a dimension greater than 1" in the upper 12" of fill or embankment.
4. Cohesionless material used for structural backfill: Provide sand free from organic material and other foreign matter, and as approved by the soil engineer.
5. Where granular base is called for under building slabs, provide aggregate complying with requirements of Section 03300 of these Specifications.

2.2 WEED KILLER

A. Provide a dry, free-flowing, dust-free chemical compound, soluble in water, capable of inhibiting growth of vegetation, and approved for use on this Work by governmental agencies having jurisdiction.

2.3 TOPSOIL

A. Where and if shown on the Drawings or otherwise required, provide topsoil consisting of friable, fertile soil of loamy character, containing an amount of organic matter normal to the region, capable of sustaining healthy plant life, and reasonable free from subsoil, roots, heavy or stiff clay, stones larger than 2" in greatest dimension, noxious weeds, sticks, brush, litter, and other deleterious matter.

B. Obtain topsoil from sources within the project limits, or provide imported topsoil obtained from sources outside the project limits, or from both sources.

2.4 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 FINISH ELEVATIONS AND LINES

A. Comply with pertinent provisions of Section 01050.

3.3 PROCEDURES

A. Utilities:

1. Unless shown to be removed, protect active utility lines shown on the Drawings or otherwise make known to the Contractor prior to excavating. If damaged, repair or replace at no additional cost to the Owner.
2. If active utility lines are encountered, and are not shown on the Drawings or otherwise made known to the Contractor, promptly take necessary steps to assure that service is not interrupted.
3. If service is interrupted as a result of work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.
4. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Engineer and secure his instructions.
5. Do not proceed with permanent relocation of utilities until written instructions are received from the Engineer.

B. Protection of persons and property:

1. Barricade open holes and depressions occurring as part of the Work, and post warning lights on property adjacent to or with public access.
2. Operate warning lights during hours from dusk to dawn each day and otherwise required.
3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by operations under this Section.

C. Dewatering:

1. Remove all water, including rain water, encountered during trench and sub-structure work to an approved location by pumps, drains, and other approved methods.
2. Keep excavations and site construction area free from water.

D. Use means necessary to prevent dust from becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

E. Maintain access to adjacent areas at all times.

3.4 EXCAVATING

A. Perform excavating of every type of material encountered within the limits of the Work to the lines, grades, and elevations indicated and specified herein.

a. Fill unauthorized excavations by extending the indicated bottom elevation of the footing or base to the excavation bottom, without altering the required top elevations.
b. When acceptable to the soil engineer, lean concrete fill may be used to bring the bottom elevation to proper position.

3. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations, unless otherwise directed by the soil engineer.

J. Stability of excavations:
1. Slope sides of excavations to 1:1 or flatter, unless otherwise directed by the soil engineer.
2. Shore and brace where sloping is not possible because of space restrictions or stability of the materials being excavated.
3. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

K. Shoring and bracing:
1. Provide materials for shoring and bracing as may be necessary for safety or personnel, protection of work, and compliance with requirements of governmental agencies having jurisdiction.
2. Maintain shoring and bracing in excavations regardless of the time period excavations will be open.
3. Carry shoring and bracing down as excavation progresses.

L. Excavating for structures:
1. Conform to elevations and dimensions shown within a tolerance of 0.10 ft., and extending a sufficient distance from footings and foundations to permit placing and removing concrete formwork, installation of services, other construction required, and for inspection.
2. In excavating for footings and foundations, take care not to disturb bottom of excavation:
a. Excavate by hand tools to final grade just before concrete is placed.
b. Trim bottoms to required lines and grades to leave solid base to receive concrete.
3. Excavate for footings and foundations only after general site excavating, filling, and grading are complete.

M. Excavating for pavements:
1. Cut surface under pavements to comply with cross sections, elevations, and grades.

N. Cold weather protection:
1. Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F.

3.5 FILLING AND BACKFILLING

A. General:
   1. For each classification listed below, place acceptable soil material in layers to require subgrade elevations.
   2. In excavations:
      a. Use satisfactory excavated or borrow material.
   3. Under asphalt pavements:
      a. Use subbase materials.
   4. Under building slabs:
      a. Use granular fill, if so called for on the Drawings, complying with aggregate acceptable under Section 03300 of these Specifications.

B. Backfill excavations as promptly as progress of the Work permits, but not until completion of the following.
   1. Acceptance of construction below finish grade including, where applicable, dampproofing and waterproofing.
   2. Inspecting, testing, approving, and recording locations of underground utilities.
   3. Removing concrete formwork.
   4. Removing shoring and bracing, and backfilling of voids with satisfactory materials.
   5. Removing trash and debris.
   6. Placement of horizontal bracing on horizontally supported walls.

C. Ground surface preparation:
   1. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious matter from ground surface prior to placement of fills.
   2. Plow, strip, or break up sloped surfaces steeper than on vertical to four horizontal so that fill material will bond with existing surface.
   3. When existing ground surface has a density less than that specified under "compacting" for the particular area, break up the ground surface, pulverize, moisture-condition to the optimum moisture content, and compact to required depth and percentage of maximum density.

D. Placing and compacting:
   1. Place backfill and fill materials in layers not more than 8" in loose depth.
   2. Before compacting, moisten or aerate each layer as necessary to provide the optimum moisture content.
   3. Compact each layer to required percentage of maximum density for area.
   4. Do not place backfill or fill material on surfaces that are muddy, frozen, or containing frost or ice.
   5. Place backfill and fill materials evenly adjacent to structures, to required elevations.

6. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around the structure to approximately the same elevation in each lift.
7. Where the construction includes basement or other underground walls having structural floors over them, do not backfill such walls until the structural floors are in place and have attained sufficient strength to support the walls.

3.6 GRADING

A. General:
   1. Uniformly grade the areas within limits of grading under this Section, including adjacent transition areas.
   2. Smooth the finished surfaces within specified tolerance.
   3. Compact with uniform levels or slopes between points where elevations are shown on the Drawings, or between such points and existing grades.
   4. Where a change of slope is indicated on the Drawings, construct a rolled transition section having a minimum radius of approximately 8"-0", unless adjacent construction will not permit such a transition, or if such a transition defeats positive control of drainage.

B. Grading outside building lines:
   1. Grade areas adjacent to buildings to achieve drainage away from the structures, and to prevent ponding.
   2. Finish the surfaces to be free from irregular surface changes, and:
      a. Shape the surface of areas scheduled to be under walks to line, grade, and cross-section, with finished surface not more than 0.10 ft. above or below the required subgrade elevation.
      b. Shape the surface of areas scheduled to be under pavement to line, grade, and cross-section, with finished surface not more than 0.05 ft. above or below the required subgrade elevation.

3.7 COMPACTING

A. Control soil compaction during construction to provide the minimum percentage of density specified for each area as determined according to ASTM D1557.

B. Provide not less than the following maximum density of soil material compacted at optimum moisture content for the actual density of each layer of soil material in place, and as approved by the soil engineer.
   1. Structures:
      a. Compact the top 8" of subgrade and each layer of fill material or backfill material at 95% of maximum density.

3.9 MAINTENANCE

A. Protection of newly graded areas:
   1. Protect newly graded areas from traffic and erosion, and keep free from trash and weeds;
   2. Repair and reestablish grades in settled, eroded, and rutted areas to the specified tolerances.

B. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape, and compact to the required density prior to further construction.

3.10 CERTIFICATION

A. Upon completion of this portion of the Work, and as a condition of its acceptance, deliver to the Engineer a written report from the soil engineer certifying that the compaction requirements have been obtained. State in the report the area of fill or embankment, the compaction density obtained, and the type of classification of fill material placed.

END OF SECTION

such additional excavation up to one foot below plan elevation shall be made. Where, in the opinion of the Engineer, it is necessary to refill such authorized excavation with gravel or stone, payment for such material shall be made under Item No. 11, "Ballast for Foundation and Drainage."

In case the foundation is in rock, the excavation shall be carried to an additional depth of eight inches (8") and the space below grade filled with select material obtained from earth excavation under this item, or with material to be furnished under Item No. 11, "Ballast for Foundation and Drainage" as permitted by the Engineer.

8. Unauthorized Excavation: In case the excavation at any point is carried below the grades or beyond the lines given, and is due to the Contractor's method of construction, the Contractor shall at his expense, refill such unauthorized depth with gravel or crushed stone thoroughly tamped in layers not to exceed four inches (4"), or with concrete, as directed, in an approved manner. In case the bottom of the excavation on which a concrete foundation is to be placed is loosened or cut into in any manner, the Contractor shall remove all such loosened material and refill to the elevation of the bottom of the foundation as shown on the Contract Plans, with concrete or other material, as approved, and at his expense.

9. Drainage and Protection of Work: The Contractor shall pump or otherwise remove any water which may be encountered or shall accumulate in the excavation; shall build all necessary bulkhead work, temporary drainage piping, and in general do all protective work needed during the progress of construction. He shall have at all times upon the work sufficient plant and pumping machinery, in good operating condition ready for immediate use to remove all ground and surface water sufficiently so that the structure or sewers will be laid on a dry foundation and will not in the opinion of the Engineer, be affected by the infiltration of water.

   The Contractor shall, during the progress of the work, provide connecting drains, sumps, drainage pipes, pumping equipment, and other facilities required to remove surface water which may come on or into the streets or alleys or rights-of-way upon which work is being performed under this Contract. All such drainage equipment shall be built, provided for and operated by the Contractor, and the water shall be pumped as far as necessary. All such water removing equipment shall be of ample capacity, and shall be kept in good operating condition until, in the opinion of the Engineer, these water removing devices and equipment will no longer be necessary. Drainage from trenches shall not be discharged to water of the State without treatment in sedimentation basins.

The cost of diverting surface and ground water from the trenches shall be included in this item. The cost of transporting water to erosion and sedimentation control facilities and the cost of such facilities shall be included and paid for under Item No. 17, "Erosion and Sedimentation Control Facilities".

The Contractor's plan of dewatering trenches in wet and/or soft foundations shall be such as not to permit water to flow over or soften the surfaces upon which pipe and structure are to be built. If necessary, the method of well points shall be used. The cost of installation and operation of the equipment shall be included under these items.

10. Protection of Utilities, Private and Public Property: The Contractor shall take every precaution to prevent injury or breakage to all existing structures, gas mains, electric conduits, sewers, drains, water lines, poles, and all other surface and subsurface structures, under, over or along side of which the sewers will be located, and in case of injury they shall be restored by him without compensation therefor, in as good condition as that in which they were found. The Contractor shall submit his method of procedure of this work to the Engineer for approval, but such approval shall not relieve the Contractor from liability for any damages.

    When gas or water mains or service lines, telephone conduits, supporting poles for electric power lines, street lights, or telephone lines require removal or relocation, or become unavoidably broken, disconnected, destroyed, or removed, the Contractor shall immediately advise the Engineer, and shall immediately notify the proper public utility company or its representative and the owner, so that such required removal, relocation or repairs may be completed. All repairs to private or public property or of any utility occasioned by carelessness of the Contractor or unnecessary or wanton destruction shall be made at the expense of the Contractor.

    When water mains or service lines are broken, disconnected, destroyed or removed, or leaks develop, occasioned by work under this Contract, the Contractor shall immediately make or arrange for repairs to be made and shall restore service at his expense and at no cost to the owner.

    Where facilities of public utility companies require removal or relocation, the Contractor shall give sufficient advance notice to the Engineer to permit arrangements to be made for the removal or relocation of such facilities in order to prevent any delay in the work.

    The Contractor shall plan his work in such a manner on streets and thoroughfares that traffic and access to properties may be maintained at all times.

11. Maintenance and Restoration of Walks, Curbs, Sewers, Drains and Pavement: The Contractor shall construct such temporary bridging over trenches in roads, streets, alleys, driveways and parking lots as required to afford owners and business establishments access to their properties; and he shall maintain all walks and driveways in a safe condition for foot and vehicular traffic at all times during the construction period. No additional compensation will be allowed for temporary repavement or bridging.

    Upon completion of construction of the sewers and structures, all temporary structures shall be removed and the curbs, walks and pavements restored to a condition as good as that in which they were found at the start of the work. Replacement of concrete and bituminous pavements shall be included and paid for under other items.

12. Sheeting, Shoring and Bracing: Excavations shall be properly and securely shored in accordance with regulations of the Federal Department of Labor such as the Occupational Safety and Health Act of 1970, as amended and to the satisfaction of the Engineer, and where ordered, close timber sheeting or sheet steel piling shall be driven in advance of the excavation. The sheeting shall be driven to such depths as required, and shall be made in all particulars satisfactory to the Engineer. In addition, the Contractor shall take such other precautions that might be necessary to prevent any damage to private or public property by reason of the construction. The Contractor shall be responsible for any damage to public or private property due to the failure or insufficiency of the sheeting and shoring.

    All sheeting and shoring not ordered left in place by the Engineer shall be removed during backfilling and before backfilling is completed, in such a manner that will prevent caving in and permit proper compacting of the fill. Upon removal, all voids shall be carefully filled and rammed with suitable tools.

    Lumber for foundations, sheeting, and shoring shall be merchantable grade, sawed, structural grade Yellow Pine or Oregon Fir, straight, sound, free from shakes, large, loose and decayed knots, wormholes or other imperfections that may impair its strength or durability. Sheet steel piling shall be of the standard size and weight for the required depth.

    All shoring and sheeting shall be placed in such a manner as not to interfere with the installation of pipes or structures.

    All shoring and sheeting shall be placed at the earliest possible time to prevent surface cracks in the earth and structures adjacent to the excavations. The cost of shoring and sheeting shall be included in the unit prices bid under these items. The cost of repairing structures damaged in

the process of excavation shall be borne by the Contractor under these items.

Portable trench boxes or sliding trench shields may be used for the protection of personnel in lieu of a shoring system of sloping. Where such trench boxes or shields are used, they shall be designed, constructed, and maintained in manner which will provide protection equal to or greater than the sheeting or shoring required for the trench.

13. Contractor not Relieved of any Responsibility: The neglect, failure or refusal of the Engineer to order the use of sheeting, or steel piling, or better quality, or large sizes of timber, or to order sheeting, sheet piling, bracing, shores, etc., to be left in place, or the giving or the failure to give any orders or directions as to the manner and methods of driving or placing of sheeting, bracing, shores, etc., shall not in any way or to any extent, relieve the Contractor of any or all of his obligations under this Contract.

14. Tunneling and Boring: In general, no tunneling or boring will be allowed except by written permission of the Engineer after approval of the Contractor's method of installation and backfill. Where tunneling or boring is permitted, the Contractor shall be responsible for any damages which this method of excavation may cause to pavements, curbs, drains, property or structures.

    The tunneling work shall be timbered, sheeted, and shored, and shall at all times be subject to the directions given by the Engineer in the field. All timbering, sheeting and shoring shall be left in place and the entire tunnel filled with granulated slag or with concrete. No extra compensation will be allowed for tunneling or for any labor or materials in connection therewith.

    Boring and jacking of pipe in private right-of-way and under pavement, if permitted, shall also be done in such a manner as to permit installation of the sewer at the grade specified. No extra compensation will be allowed for boring and jacking pipe or for any labor, encasement pipe or other materials in connection therewith.

15. Storage of Materials on Streets and Highways: During the progress of the work, the Contractor shall store the excavated materials, and materials of construction along the line of the work, in such place or places as the Engineer shall approve and in conformance with the requirements herein below specified.

    The materials shall be so stored that traveled roadways shall be open for at least two lanes of traffic, and so that a continuous walkway, at least three feet in width in the clear, shall be provided on one side of the road. In all cases valve boxes on gas and water lines, hydrants, sewer manholes, or other

facilities of public utilities shall be kept accessible. The Contractor shall provide access to any public or private property. Free passage for surface water shall be maintained in the gutter of all streets and roadways upon which work is in progress.

The Contractor shall keep himself advised concerning the regulations of all State, County, Private and other agencies having jurisdiction over roads and streets and shall conform to the requirements of those agencies in reference to vehicular and pedestrian traffic and drainage, and protection of materials and excavation stored along the roadway.

16. Backfilling: The material for backfilling shall be clean loam, gravel, or sand, obtained from excavation and shall be free from large stones and all perishable matter which would prevent proper consolidation or cause after-settlement.

Select earth shall be used around and over all pipe and structures to an elevation at least one (1) foot above the top of the pipe or foundation. Extreme care shall be taken that the material is placed evenly under and around sides of the pipe lines and structures in such a manner as to prevent any pushing or movement laterally in any method. The upper 18 inches of the trench in traffic locations where surface settlement is important shall be backfilled in the same manner so indicated for the bottom section carrying one (1) foot above the top of the pipe. The refill material for the remaining portion of the trench may contain not more than 30 percent rock or stone not larger than 8 inches in the greatest dimension. Where such refill is used, the voids between the pieces shall be filled and properly tamped.

After the completion of a section of the pipe line and structures, allowing for all inspection and tests, the refill material shall be deposited in the excavation in layers not over four (4) inches thick for the first 12 inches over the top of the pipe or foundation and six (6) inches thick thereafter. The material shall be placed evenly and simultaneously on both sides of the structure to avoid unbalanced loads and shall be compacted thoroughly with suitable tools. Where necessary to secure proper compaction, the materials may be moistened. The amount of water which may be added to the material shall be such that the optimum moisture point of the material shall not be exceeded. All excavation shall be backfilled by the use of mechanical tampers.

In general, mechanical tamping shall be required for all backfilling. The mechanical tamping shall be performed during the placing of the backfill with a rammer capable of striking 550 blows per minute at a pressure of 90 pounds per square inch. The force of each blow shall be at least 65-foot pounds.

Where the use of mechanical tampers is impractical for any reason, backfilling shall be placed in layers not more than four (4) inches in depth, thoroughly compacted with rammers having bases not in excess of thirty-six (36) square inches and weighing not less than twenty (20) pounds. Where such equipment is employed, there shall be two men tamping for each man shoveling backfill materials.

No backfilling shall be done with frozen material or in freezing weather. All coarse and lumpy earth shall be pulverized before being placed in backfill. No rock fragments larger than eight (8) inches in the largest dimension shall be placed in the backfill, and where such backfill is permitted, the spaces between the pieces shall be well filled with earth and tamped. No rock fragments shall bear directly against any pipe or structure.

17. Road and Street Surfaces: The Contractor shall repair and replace all roadway and street surfaces, damaged from any cause whatsoever by reason of the work under this Contract. The entire width of the road or street shall be left in as good condition as before excavation was started, and shall be satisfactory in all respects to the Engineer. Payment for removal and replacement of hard surfaced roads and streets will be made under other items of this Contract.

18. Disposal of Surplus Materials: Where the work under this Contract is done on or along streets or highway, the Contractor shall, during the progress of the work, clean the roadway surfaces, remove surplus materials and flush gutters up to a point within two hundred (200) feet of the end of the finished work.

    The Contractor shall, immediately upon completion of backfilling, remove or dispose of all rubbish and surplus excavation, all temporary structures, and all surplus materials brought to or used in the work. The surplus excavation shall be deposited by the Contractor at the point or points designated, at his expense. Where the work is upon easement, the Contractor shall clean up the surface of the ground and restore it to its original condition, supplying such materials, as are necessary at his expense. The beds of all creeks and water courses shall be graded and restored to their original condition and all obstructions removed therefrom.

19. Grading: The ground around completed structures, and adjacent areas within the limits of grading shown on the plans, and all fills, spoil banks, and embankments shall be rough graded to the elevations as shown or as may be directed. All surfaces shall be left even, smooth, and free from sticks, stones and rubbish.

    Certain exploratory excavations to determine location and depth of existing utilities may be required to be performed by the Contractor at various

locations prior to and during the progress of work under this Contract. Payment for this excavation shall be included under these items of the Contract.

20. Blasting; General: There shall be no blasting unless written permission has been secured from the Engineer. When permitted, blasting shall be conducted so as not to endanger persons, structures and/or property, and the Contractor shall be held responsible for and shall make good any damage caused thereby. He shall comply with all regulations, laws and ordinances governing this class of work. The Contractor, before firing a blast, shall cover the area adjacent the charge carefully with heavy timber, mats or other material to prevent stone from flying. No blasting shall be done within 25 feet of completed structures.

    No blasting will be permitted until the Contractor has furnished the Engineer and the Owner with proof that his insurance coverage includes personal liability and property damage to surface and subsurface structures as indicated in the applicable claims of the Contract Provisions.

    However, if no alternative is found except to blast, the total charges shall be very small and blasting mats should be used to cover the specific blast areas. Also, seismograph monitoring shall be performed at several points around the blasting operations.

    If blasting is performed at this site for breaking of the rock, the maximum amount of total charge used for each blast should be less than 1.5 pounds of dynamite or comparable explosive material that provides the same charge as 1.5 pounds of dynamite. The rock where the blast is occurring shall be covered and protected with blasting mats. Also, the blasting shall be carefully monitored with seismograph equipment placed about 200.0 feet from the blast or adjacent to a structure near the blast. The maximum peak particle velocity recorded for this blasting at 200.0 feet away shall be less than 1.0 inch per second. The amount of charge to be utilized shall be predetermined by the Contractor based upon his years of experience in this field. Any trial and error method of determining the amount of charge shall only be performed with extreme caution so as not to damage the existing structures.

21. Storing of Explosives: The Contractor shall provide separate fireproof receptacles, plainly marked with three-inch letters, "EXPLOSIVE -- DANGER", for blasting powder and dynamite, fuses and caps. Storing of blasting powder, dynamite, fuses and caps in a tool box will not be permitted. Explosives shall be handled with great care, and shall be at all times in charge of a competent watchman.

22. Embankment Construction: Embankment construction shall consist of preparation of the areas upon which embankments are to be placed; the placing and compacting of approved materials within the structure and roadway areas where unsuitable material has been removed; and the placing and compacting of embankment material in holes, pits and other depressions within the construction area. Only approved materials shall be used in the construction of embankments and backfills. Frozen material shall not be placed in the embankment nor shall embankment be placed on frozen material.

    Embankment methods, moisture and density control, and compaction shall conform to Item 203, "Roadway Excavation and Embankment" of the State of Ohio, Department of Transportation, "Construction and Material Specifications" dated January 1, 1995.

23. Compensation: The payment for all work under this item shall be at the Contract lump sum price as bid therefor, for Item No. 3, which is full compensation for all labor, materials, and equipment as herein specified.

DETAILED SPECIFICATIONS

GRADING, MULCHING, SEEDING AND CLEAN-UP

Item No. 16

1. Work Included: The work under this item shall include all labor, materials and equipment necessary for the finish grading, topsoiling, fertilizing, mulching, planting, landscaping, cleaning-up and all incidentals necessary to restore to the original condition all surfaces such as lawns, unimproved streets, alleys, driveways and sidewalks not included in other items of this Contract.

   The limits of work for this item shall include all areas within the construction site, borrow pits, restoration of temporary erosion control facilities, entrance road and any other areas disturbed as a result of construction activities necessary for the execution of this Project.

2. Work Not Included: The requirements for clearing and grubbing, unclassified excavation, rough grading and similar preliminary work shall be paid for and as specified in previous items of these Specifications.

3. Finish Grading: Areas requiring topsoil shall be graded to within four (4) inches of the finished grade. The soil shall be loosened by discing or scarifying to a minimum depth of two (2) inches to ensure proper bonding of the topsoil.

   Areas not requiring topsoil shall be graded to the finished grade as shown on the Contract Drawings or as directed by the Engineer. These areas shall be smooth, even, free of all deleterious material and stones exceeding two inches approximately in any dimension and ready for planting.

   Seedbed preparation shall not be necessary on slopes greater than 3 to 1.

4. Topsoil: Topsoil shall be furnished and spread in required areas to a minimum depth of five (5) inches unless otherwise specified. Stockpiles topsoil from Item 3 shall be used where possible. In the event that stockpiling is not satisfactory or is inadequate to cover the required area, the Contractor shall furnish satisfactory topsoil at his own expense. After spreading the soil, all deleterious material and stones exceeding two (2) inches approximately in any dimension shall be raked up and removed from the site. The soil shall be uniformly compacted with a light hand roller to a final depth of four (4) inches. Any irregularities shall be corrected before the fertilizer and seed are placed.

5. Fertilizer and Liming: The fertilizer shall be complete, partially organic, commercial 12-12-12 or its equivalent, dry or wet. The fertilizer shall be uniformly spread in lawn areas at a rate of 20 pounds per 1000 square feet. The fertilizer shall then be lightly raked into not less than 2 inches of topsoil to

prepare the seedbed. Other commercial fertilizers and liming may be used if approved by the Engineer or determined by soil test.

6. Seeding: Immediately following area preparation, seed shall be sown. Legume seed shall be inoculated with approved cultures, in accordance with the instruction of the manufacturer. When using a hydroseeder, the inoculate shall be increased to five times the normal rate.

   Seed shall be sown by approved methods which provide for uniform distribution of seed. Rates of application and type of seed moisture shall be in accordance with the Ohio Department of Transportation, Item 659 of the "Construction and Material Specifications" dated January 1, 1995.

   All sloped areas with steeper grades than 2 to 1 shall be seeded with Crown Vetch as per Ohio Department of Transportation, Item 659.

   All other areas shall be considered urban in character. The seedbed shall be prepared as previously specified. After sowing the area shall be lightly brushed or raked to provide a slight covering over the seed then lightly rolled. The area shall be kept moist until the seed germinates as per Item 659.

   It is recommended that permanent seeding be performed between the dates of March 1 to June 15 and August 1 to October 15.

7. Maintenance: Maintenance of seeded and planted areas shall include watering during dry periods, reseeding, repairs and replacements during the planting season. The Contractor shall insure a good final stand of grass and areas which do not show a prompt catch of grass shall be reseeded as required. Maintenance of seeded areas shall be for one year after acceptance of the project.

8. Mulching: The Contractor shall protect and maintain seeded areas to assure a full even stand of grass. Critical areas requiring stabilization or to insure proper germination shall be mulched at the Contractor's expense with approved mulching material. Upon completion of the contract, the Contractor is required to show all seeded areas uniformly germinated and should remove all excess mulch.

   Mulching material shall be free of mature seed bearing stocks or roots and prohibited or noxious weeds, and composed of hay, straw, wood cellulose or other approved material. Mulch shall be anchored with twine, stakes, paper or plastic nets, or other approved methods, where required.

9. Planting and Replacement: The Contractor shall furnish and plant or install all trees, shrubs, fences, mailboxes, sign posts and the like to restore the area to its original condition. Where plantings are required, they shall be

supplied by the Contractor from items removed during "Clearing and Grubbing" or from nursery stock of size and quality complying with the American Association of Nurserymen. Plants shall be installed in accordance with recommendations of local nurserymen.

10. Landscaping: Plant materials shall conform at all times to the requirements hereinafter given. No inspection of plant materials shall act to change or modify any of these requirements in any way.

    Quantities: The Contractor shall furnish quantities necessary to complete the planting as shown and located on the grading plan.

    Quality: All plants shall be true to type and name and typical of their species or variety; they shall have normal, well developed branch systems and vigorous, fibrous root systems; they shall be sound, healthy, vigorous plants, free from defects, disfiguring knots, sun scald injuries, abrasions of the bark, plant diseases, insect eggs, borers, and all forms of infestation.

    All plants shall be nursery grown unless otherwise stated; they shall have grown under similar climatic conditions as the location of this project for at least two (2) years prior to the date of this contract. All plants freshly dug; no heeled in plants and no plants from cold storage will be accepted.

    Shrubs: Shrubs can be well branched and have ample, well balanced root systems capable of sustaining vigorous growth.

    Planting Season: Planting shall be executed according to the following schedule: March 15 through May 15, and August 15 through November 15. These periods may be extended or restricted according to the prevailing weather conditions at the time and at the discretion of the Engineer. All ground cover shall be spring planted unless otherwise specified.

    Shrub Pits: All shrubs shall be planted in individual pits. Shrubs B & B shall be planted in pits at least one (1) foot greater in diameter than the ball of earth. Pits for bare rooted shrubs shall be eighteen (18) inches greater than the spread of the roots and at least fifteen (15) inches deep.

11. Clean-Up: The Contractor shall frequently remove all refuse, rubbish, scrap, or debris caused by his operations so that the project area shall be left in a neat, sightly condition.

    Clean-up shall be performed during construction as required to prevent accident to personnel, and to effect completion of the project in an orderly manner.

f. In some instances it will be necessary to pump water from trenches and excavations during construction. Water pumped from trenches and excavations will be pumped into a sedimentation basin if necessary to avoid excessive siltation of waterways or damage to adjacent properties. All sedimentation basins will be carefully removed after use.

g. Sediment barriers shall be used at storm drain inlets, across minor swales and ditches, and at other locations where necessary. Sediment barriers shall be constructed of hay or straw bales, securely anchored, to retain sediment by filtering runoff.

h. Diversion terraces are to be used as a temporary measure installed on the uphill side of the disturbed area to divert surface runoff away from unstabilized slopes.

i. Interceptor channels are to be used across disturbed areas where the slope is running parallel to the direction of the sewer line.

j. The excavation for stream crossings should tank place at low flow. The method used to control erosion when crossing a stream will be dependent upon conditions of the particular site. Baled hay or straw barriers shall be installed downstream to filter sediment. In smaller streams, the flow may be temporarily dammed. when excessive sediment is produced behind a sediment barrier, it may be necessary to pump water into a sedimentation basin and gradually allowed to flow back into the stream.

k. Only construction equipment necessary to install a sewer under the stream bed will be permitted to cross the stream. This may necessitate the construction of temporary culvert stream crossings or other facilities to avoid excessive disturbance of the stream bed.

l. Roadways and parking lots shall be paved or otherwise stabilized as soon as feasible.

3. Site Conditions: Bidders shall satisfy themselves by personal examination of the location of the proposed work and by such means as they may choose as to the actual conditions and requirements of the work, to enable them to make their bids intelligently and to advantage. No allowance will be made as to the nature and character of the site of the work involved or for material of an unexpected character found in excavation.

4. Responsibility: In case of repeated failure on the part of the Contractor to control erosion, pollution, or siltation, the Engineer reserves the right to employ outside assistance to provide the necessary corrective measures.

Such incurred direct costs will be charged to the Contractor and deductions made from the Contractor's monthly progress estimate.

5. Restoration: After all construction work is completed, the Contractor shall remove all structures, remove sediment and embankments, and generally restore the area, as practicable, to that which existed before construction. "Final Grading, Mulching, Seeding and Clean-Up" shall be paid for and as specified under Item 16 of these Specifications.

6. Price Breakdown: The Contractor shall provide to the Engineer the unit price breakdown of all the components of this lump sum item used in determining the bid price.

7. Compensation: The payment for all work under this item shall be the lump sum price as bid therefore for Item No. 17, which is full compensation for all labor, materials and equipment as herein specified.

CANTON DROP FORGE
Stark County, Ohio
Proposal for
BIOREMEDIATION
Contract 95-2

NOTE 1: THE SIGNING OF THE BID REPRESENTS THE BIDDER'S ACCEPTANCE OF THE TERMS AND CONDITIONS OF THE INSTRUCTIONS TO BIDDERS AND THE SPECIFICATIONS AND PROVISIONS AND THAT THE BIDDER WILL ENTER INTO THE CONTRACT IF HE IS AWARDED THE BID AND WILL ENTER SAID CONTRACT WITHIN TEN (10) DAYS OF NOTICE OF AWARD. BID IS TO BE FIRM AND MAY NOT BE WITHDRAWN FOR A PERIOD OF SIXTY (60) CALENDAR DAYS.

NOTE 2: THE BIDDER AGREES THAT CANTON DROP FORGE HAS THE RIGHT TO REJECT ANY OR ALL BIDS AND TO WAIVE INFORMALITY IN ANY BID AND THAT THE BIDDER SHALL NOT DISPUTE THE CORRECTNESS OF THE METHODS USED IN COMPUTING THE LOWEST RESPONSIBLE BIDDER.

NOTE 3: ALL COSTS OF MAINTENANCE WORK DURING CONSTRUCTION AND BEFORE THE FINAL ACCEPTANCE IS MADE SHALL BE INCLUDED IN THE LUMP SUM PRICES BID ON THE VARIOUS BID ITEMS AND THE CONTRACTOR WILL NOT BE PAID AN ADDITIONAL AMOUNT FOR SUCH WORK.

TO: CANTON DROP FORGE
4575 SOUTHWAY STREET S.W.
P.O. BOX 44706
CANTON, OHIO 44706

FROM: The Critter Company, Inc.
FIRM NAME

6890 E. Sunrise Drive, #120-10

Tucson, Arizona 85715
ADDRESS

TELEPHONE NO. (520) 299-9808

Canton Drop Forge
Ex-Situ Bioremediation - Lagoon #1

April 1995

Item No	Item	Est'd Quantity	Unit	Separate Unit Prices (figures)		Combined Unit Prices (to be written in words)	Quantity Times Unit Total
				Mat'L	Labor	Mat'l-Labor-Unit-Total	Amount
1.1	Removal of materials lining Lagoon 1	3,000	c.y.	N/A	$5.50/cy	FIVE DOLLARS AND FIFTY CENTS PER CUBIC YARDS	$16,500
1.2	Transportation of materials from Lagoon 1 to biocell(s)	3,000	c.y.	N/A	$5.80/cy	FIVE DOLLARS AND EIGHTY CENTS PER CUBIC YARDS	$17,400
1.3	Construction of biocell(s) for Lagoon 1 materials	Lump	Lump	N/A	$1,920	ONE-THOUSAND AND NINE-HUNDRED AND TWENTY DOLLARS	$ 1,920
1.4	Treatability study of materials in Lagoon 1	Lump	Lump	N/A	N/A	-	-
1.5	Bulking of materials from Lagoon 1 with on site materials if required*	1,000	c.y.	N/A	N/A	-	-
1.6	Bulking of materials from Lagoon 1 with off site materials if required*	1,000	c.y.	N/A	N/A	-	-
1.7	Inoculation of materials in Lagoon 1 biocell(s)**	3,000	c.y.	$4.00/c.y.	$8.00/c.y.	TWELVE DOLLARS PER CUBIC YARD	$36,000
1.8	Inoculation of Lagoon 1 lining after sludge removal	Lump	Lump	$1,000	$2,000	THREE THOUSAND DOLLARS	$ 3,000
1.9	Site visits	30	Ea.	Included on 1.7	item	-	-

If the contractor does not expect the use of bulking material please indicate by using N/A

* All items may not be required. Unit process will still be useful in the event that all items are required.

** Inoculation costs shall be based on c.y. of material excavated from the Lagoon #1, not the bulked volume.

Sub-Total Lagoon No. 1 $ 74,820.00

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Canton Drop Forge
Ex-Situ Bioremediation - Lagoon #2

April 1995

Item No	Item	Est'd Quantity	Unit	Separate Unit Prices (figures)		Combined Unit Prices (to be written in words)	Quantity Times Unit Total
				Mat'L	Labor	Mat'l-Labor-Unit-Total	Amount
2.1	Removal of materials lining Lagoon 2	6,000	c.y.	N/A	$5.50/c.y.	FIVE DOLLARS AND FIFTY CENTS PER CUBIC YARDS	$33,000
2.2	Transportation of materials from Lagoon 2 to biocell(s)	6,000	c.y.	N/A	$5.80/c.y.	FIVE DOLLARS AND EIGHTY CENTS PER CUBIC YARDS	$34,800
2.3	Construction of biocell(s) for Lagoon 2 materials	Lump	Lump	N/A	$1,920	ONE-THOUSAND, NINE HUNDRED AND TWENTY DOLLARS	$ 1,920
2.4	Treatability study of materials in Lagoon 2	Lump	Lump	N/A	N/A	–	–
2.5	Bulking of materials from Lagoon 2 with on site materials if required*	6,000	c.y.	N/A	N/A	–	–
2.6	Bulking of materials from Lagoon 2 with off site materials if required*	6,000	c.y.	N/A	N/A	–	–
2.7	Inoculation of materials in Lagoon 2 biocell(s)**	6,000	c.y.	$4.00/c.y.	$8.00/c.y.	TWELVE DOLLARS PER CUBIC YARDS	$72,000
2.8	Inoculation of Lagoon 2 lining after sludge removal	Lump	Lump	$2,000	$4,000	SIX-THOUSAND DOLLARS	$ 6,000
2.9	Site visits	30	Ea.	Included 2.7	on item	–	–

If the contractor does not expect the use of bulking material please indicate by using N/A

* All items may not be required. Unit process will still be useful in the event that all items are required.

** Inoculation costs shall be based on c.y. of material excavated from the Lagoon #2, not the bulked volume.

Sub-Total Lagoon No. 2 $ 147,720.00

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TOTAL AMOUNT OF BID

Two-Hundred and Twenty-Two ($ 222,540.00)

(Written Out) Thousand, Five-Hundred and Forty dollars and no cents.

The Contractor agrees to complete all of the work specified for this contract within five hundred forty-eight (548) calendar days (one and one half years) after the date of Notice to Proceed. The bid prices shall include all labor, materials, equipment, overhead, profit, insurance, etc., to cover the finished work. Should contamination still exceed target levels (TPH≤380 ppm), after one and one half years, a meeting between CDF representatives and the contractor shall occur. Based on this meeting CDF will either:

1. Require that all contaminated material resulting from this project be excavated and moved off site for disposal (no further treatment) at a regulated landfill, at no cost to CDF.

OR

2. Allow the contractor six (6) additional months to achieve target levels at no cost to CDF. If after the six (6) month extension target levels have not been achieved, CDF may exercise Option 1. Should the landfilling option be exercised, the contractor must receive CDF approval of all proposed disposal activities prior to disposal. After disposal CDF shall receive documentation verifying proper disposal. If the Contractor does not submit an approved disposal plan within six (6) months of the formal decision to exercise Option 1, CDF may seek outside contractors to remove the TPH contaminated soil resulting from ex-situ bio-remediation attempts. If in-situ means are used, 3,000 c.y. from Lagoon #1 and 9,000 c.y. from Lagoon #2 shall be removed. CDF will bill the bio-remediation contractor for all disposal activities.

Bidder understands that Canton Drop Forge (CDF) reserves the right to reject any or all bids and waive any informalities in the bidding. The bidder agrees that this bid shall be good any may not be withdrawn for a period of 60 calendar days after the scheduled closing time for receiving bids.

Upon receipt of Notice of Award by CDF, bidder will execute the formal contract attached within 10 days and deliver a Surety Bond or Bonds as required. The bid security attached in the form of _____ in the sum of _____ ($_____) is to become the property of CDF in the event the contract and bond are not executed within the time above set forth, as liquidated damages for the delay and additional expense to CDF caused thereby.

BIDDER acknowledges receipt of the following ADDENDUM:

Addendum No. _____, Dated _____

Addendum No. _____, Dated _____

Addendum No. _____, Dated _____

Addendum No. _____, Dated _____

*See attached Proposal

CANTON DROP FORGE
ALTERNATE BID
IN-SITU BIOREMEDIATION

IN-SITU BIOREMEDIATION - LAGOON #1

Item 3.1	In-Situ Bioremediation of Lagoon #1. This shall consist of reducing the TPH contamination of approximately 3,000 c.y. of material to ≤ 380 ppm.	$_____ Lump

IN-SITU BIOREMEDIATION - LAGOON #2

Item 4.1	In-Situ Bioremediation of Lagoon #2. This shall consist of reducing the TPH contamination of approximately 6,000 c.y. of material to ≤ 380 ppm	$_____ Lump

$_____
Total Cost

* SEE ATT. FAXED COPY

CANTON DROP FORGE
Stark County, Ohio
Proposal for
BIOREMEDIATION
Contract No. 95-2

CANTON DROP FORGE RESERVES THE RIGHT TO ACCEPT OR REJECT ANY AND ALL BIDS. THE BID WILL BE AWARDED TO THE LOWEST RESPONSIBLE BIDDER.

BID IS FIRM FOR SIXTY (60) DAYS.

ATTACHMENTS: BID GUARANTY BOND OR CONSENT OF SURETY FORM.
NON-COLLUSION AFFIDAVIT

SIGNATURE CLAUSE:

IF A CORPORATION

_____
NAME OF CORPORATION

SIGNATURE:_____
PRESIDENT

SIGNATURE:_____
SECRETARY

IF A PARTNERSHIP:
(List All Partners)

_____
NAME OF PARTNERSHIP

SIGNATURE:_____

SIGNATURE:_____

SIGNATURE:_____

IF AN INDIVIDUAL DOING BUSINESS
UNDER THE FIRM NAME AND STYLE OF: _____

STATE OF OHIO

COUNTY OF _____ SIGNATURE:_____

SWORN TO AND SUBSCRIBED BEFORE ME THIS _____ DAY OF _____, 19___.

_____
NOTARY PUBLIC

CANTON DROP FORGE
Stark County, Ohio
Proposal for
BIOREMEDIATION
Contract No. 95-2

CANTON DROP FORGE RESERVES THE RIGHT TO ACCEPT OR REJECT ANY AND ALL BIDS. THE BID WILL BE AWARDED TO THE LOWEST RESPONSIBLE BIDDER.

BID IS FIRM FOR SIXTY (60) DAYS.

ATTACHMENTS: BID GUARANTY BOND OR CONSENT OF SURETY FORM.
NON-COLLUSION AFFIDAVIT

SIGNATURE CLAUSE:

IF A CORPORATION

The Critter Company, Inc.
NAME OF CORPORATION

SIGNATURE: Darwin J. Coon
PRESIDENT

SIGNATURE: Darwin K. Coon
SECRETARY

IF A PARTNERSHIP:
(List All Partners)

NAME OF PARTNERSHIP

SIGNATURE: _____

SIGNATURE: _____

SIGNATURE: _____

IF AN INDIVIDUAL DOING BUSINESS
UNDER THE FIRM NAME AND STYLE OF: _____

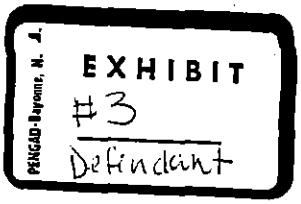
STATE OF ~~OHIO~~ Arizona

COUNTY OF Pima SIGNATURE: _____

SWORN TO AND SUBSCRIBED BEFORE ME THIS 1st DAY OF May, 1995

_____
NOTARY PUBLIC

EXHIBIT A



AGREEMENT
CONTRACT 95-2A

For BIOREMEDIATION, CANTON DROP FORGE, CANTON, OHIO.

THIS AGREEMENT, made and entered into at Canton, Ohio, this 14th day of June, 1995, by and between Canton Drop Forge Inc. (CDF), hereinafter called CDF, and The Critter Company Inc., a corporation, with an office located at 6890 E. Sunrise Drive #120-10, Tucson AZ 85715, hereinafter called the "CONTRACTOR".

WITNESSETH

That the CONTRACTOR has agreed and by these presents does agree that the CONTRACTOR, for the consideration of $117,000.00 paid by CDF hereinbefore mentioned and contained in the proposal, and under penalty expressed in a bond bearing even date with these presents, and herein contained or hereunto annexed to furnish at his own cost and expense, all the necessary materials, labor, superintendence, tools and equipment, and shall execute, construct, finish and test in an expeditious, substantial and workmanlike manner, said improvements shown on the contract drawings described in the included specification or required by CDF, with all equipment and appurtenances, commencing work within (10) days from the date of notice from CDF to commence work and executing the same within the time and in the manner specified and in conformity with the requirements set forth in the specification herein contained or hereunto attached in accordance with the contract drawings of said work on file in the office of CDF and all to the acceptance of said CDF.

The project will consist of removing the sludges lining Lagoon #1 and Lagoon #2 and using ex-situ bio-remediation technology to reduce Total Petroleum Hydrocarbon (TPH) contamination levels of the excavated materials to below the target level of 380 ppm.

The estimated removal quantities are 3,000 c.y. from Lagoon #1 and 6,000 c.y. from Lagoon #2. During excavation the contractor shall maintain quantity estimates and keep CDF informed of the quantity removed. If it appears that material beyond the estimated quantity will require removal, the contractor shall immediately contact CDF representatives. CDF may halt removal prior to reaching the estimated quantities or request the removal of material beyond the estimated quantities. Payment will be based on the actual quantity of material removed and the unit prices. Tasks related to the bioremedation project include, but are not limited to, excavation of lagoon linings, transport of excavated materials to the on-site treatment areas, treatability studies, bio-cell design, bio-cell construction, bulking of excavated materials to enhance bioremediation, inoculation of materials to be treated and maintenance of biocell(s).

Once excavation of the lagoon materials is complete the contractor shall immediately "seed" the lagoon lining and walls prior to putting the lagoon back into service.

The contractor shall also estimate the type and number of samples for laboratory analysis that shall be retrieved by an independent agent.

The CONTRACTOR shall proceed with the said work in a prompt and diligent manner and shall do the several parts thereof at such times and in such order as the Engineer or his duly authorized agent may direct. Further, he shall complete the whole of said work in accordance with the specifications and contract drawings to the satisfaction of CDF and their Engineer.

If the CONTRACTOR shall fail to comply with any of the terms, conditions, provisions, or stipulations of this contract according to the true intent and meaning thereof, then CDF may avail itself of any or all remedies provided in that behalf in the contract, and shall have the right and power to proceed in accordance with provisions thereof.

It is hereby agreed by the parties to this Agreement that the provisions contained in the "Invitation for Bids", in the "Information and Instructions to Bidders", in the "Proposal and Bid Form", in the "Insurance Specifications", in the "Performance Bond", in the "General Conditions", in the "Supplemental General Conditions", and in the Lab Reports for the improvement, shall constitute integral parts of the agreement and collectively that they shall comprise and be known as the Agreement. It is hereby mutually agreed that CDF is to pay and the CONTRACTOR is to receive, a full compensation for furnishing all materials and labor in building, constructing, and in all respects completing the herein described work and appurtenances in the manner and under the conditions herein specified, the prices stipulated in the proposal herein contained or hereto annexed.

The CONTRACTOR agrees not to discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

Subject to the applicable provisions of law, this Agreement shall be in full force and effect as a contract from and after the date when a fully executed and approved counterpart hereof is delivered to the CONTRACTOR.

IN WITNESS WHEREOF, the parties hereunto affixed their signatures, the day and year first above mentioned.

CONTRACTOR

Witness: Nancy Conn

Date: 6/9/95

THE CRITTER COMPANY, INC.

By: Jerry W. Conn

Title: President

Attest: D. R. Holloway Jr.

Date: June 14, 1995

CANTON DROP FORGE, INC.

By: Jerome P. Bernard

FACSIMILE TRANSMITTAL

Exhibit "A"

EXHIBIT #4 Defendant

DATE: 12/14/94 TIME: 3:00 ( ) A. M. (X) P. M.

TO: NAME: SCOTT KLINGENSMITH
BUSINESS NAME:
FACSIMILE NUMBER: (614) 431-8190

FROM: HAMMONTREE AND ASSOCIATES, LIMITED
5233 STONEHAM ROAD
NORTH CANTON, OHIO 44720

TELEPHONE NUMBERS: (216) 499-8817 CANTON OFFICE
(216) 633-7274 AKRON OFFICE
(216) 499-0149 FACSIMILE

SENDER'S NAME: GENE HILL
PROJECT: CDF - LAGOON #1
NUMBER OF PAGES (INCLUDING THIS PAGE): 2
BRIEF DESCRIPTION (OPTIONAL):

ADDITIONAL INSTRUCTIONS OR MESSAGES TO RECIPIENT:

SCOTT,
THE FOLLOWING PAGE IS A SUMMARY OF LAB RESULTS FOR CANTON DROP FORGE.

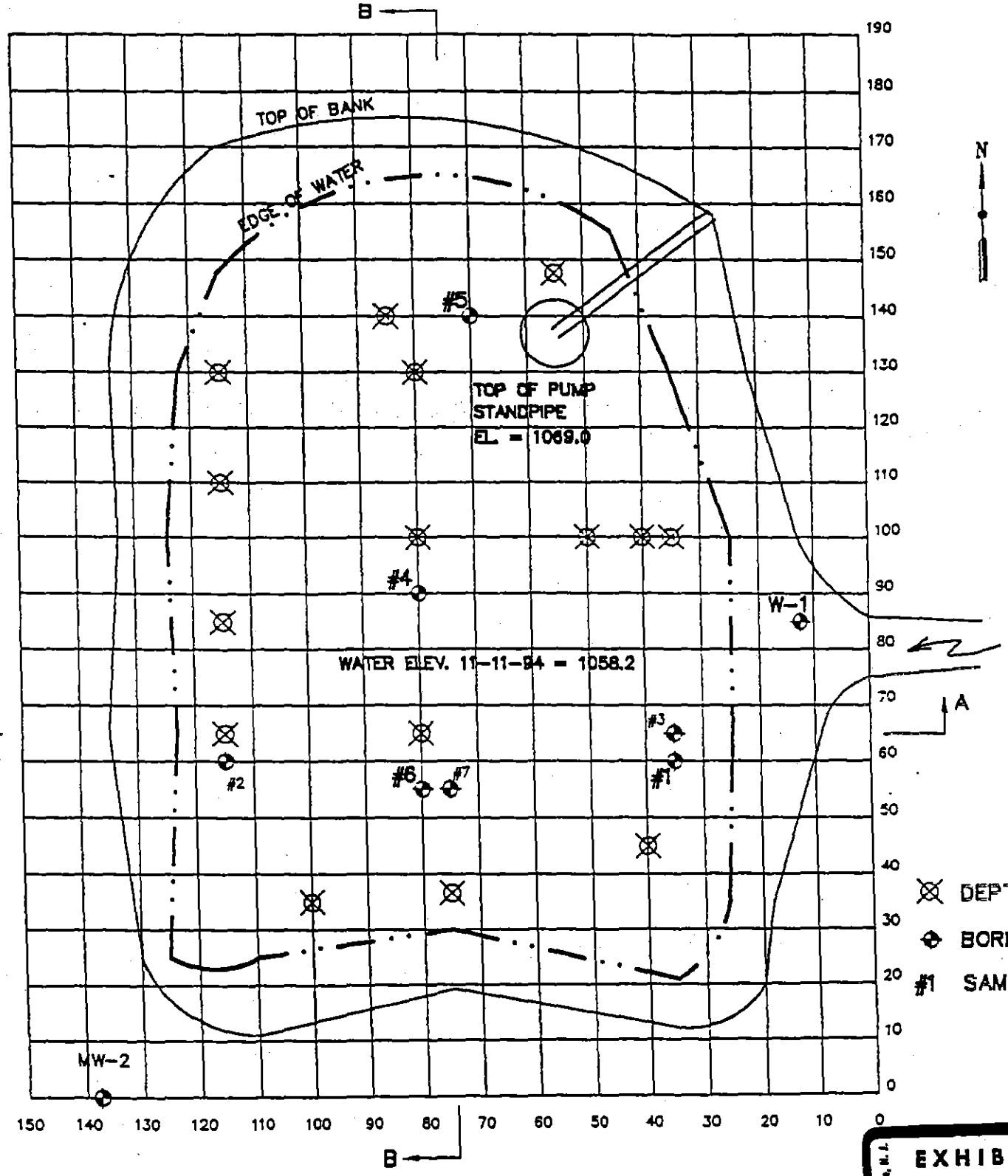
GENE

6. Paint Filter Liquids Test - landfill requirements for solid wastes
7. PCB's - due to past detection (Governed under Toxic Substance Control Act) (TSCA)
8. Total Petroleum Hydrocarbons (TPH) - due to oil and grease contamination

TABLE 1: LAGOON #2 LAB ANALYSIS SUMMARY

Parameter \ Sample #	1	2	3	4	5	6	7	Regulatory Limit
Reactive Cyanide (ppm)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Reactive Sulfur (ppm)	<25	<25	<25	<25	<25	<25	<25	
Flash Point (°F)	>140	>140	>140	>140	100	<140	<140	
pH	7.65	7.77	7.47	7.73	7.77	5.88	5.88	
Paint Filter	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	
TPH (418.1) (ppm)	13,981	13,532	33,204	14,594	57,536	31,243	303,459	380
PCB's (ppm)	<2	<2	<2	<2	<2	<2	<2	
Cresols (ppm)	<0.02	<0.02	<0.1	<0.02	<0.1	<0.1	<0.02	200
1, 4-Dichlorobenzene	<0.02	<0.02	<0.1	<0.02	<0.1	<0.1	<0.02	7.5
2, 4-Dinitrotoluene	<0.02	<0.02	<0.1	<0.02	<0.1	<0.1	<0.02	0.13
Hexachlorobenzene	<0.02	<0.02	<0.1	<0.02	<0.1	<0.1	<0.02	0.13
Hexachloro-1, 3-butadiene	<0.02	0.50	<0.1	<0.02	<0.1	<0.1	<0.02	0.5
Nitrobenzene	<0.02	<0.02	<0.1	<0.02	<0.1	<0.1	<0.02	2
Pentachlorophenol	<0.05	<0.05	<0.25	<0.05	<0.25	<0.25	<0.05	100
Pyridine	<0.05	<0.05	<0.25	<0.05	<0.25	<0.25	<.05	5
2, 4, 5 Trichlorophenol	<0.05	<0.05	<0.25	<0.05	<0.25	<0.25	<.05	400
2, 4, 6 Trichlorophenol	<0.05	<0.05	<0.25	<0.05	<0.25	<0.25	<.05	2
Hexachloroethane	<0.02	<0.02	0.1	<0.02	<0.1	<0.1	<0.02	3
Benzene	<0.005	<0.005	<0.005	<0.02	<0.005	<0.005	<0.005	0.5
Carbon Tetrachloride	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.5
Chlorobenzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	100
Chloroform	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	6
1, 2-Dichloroethane	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.5
1, 1-Dichloroethane	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.7
2-Butanone (MEK)	<0.01	<0.01	<.01	<.01	<.01	<.01	<.01	200
Tetrachloroethene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.7
Trichloroethene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.5
Vinyl Chloride	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	5
Lead	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	1
Chromium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	5
Aersenic	<0.001	0.001	0.001	<0.01	<0.001	<0.001	<0.001	5
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.2
Barium	19.0	12	<0.1	20	19	4	<0.1	100
Selenium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	1

Full Laboratory Analysis in Appendix B
Bold print in chart indicates samples exceeding regulated limits



SAMPLE LOCATIONS

W-1: FROM THE SIDEWALL, A GRAVELLY SAMPLE

1: THICK GREASE, ALMOST CLAY, COMPOSITE FROM 1.9' INTO MUCK AND 4.7' INTO MUCK

4: SOFY CLAY (BLACK) TO FAIRLY CLEAN GREASE (APPROX. 2.5' TO 4.0' BELOW MUCK)

5: DARK CLAY TO TAN CLAY 2.0' TO 2.5' BELOW MUCK

6: GREASE TO BLACK CLAY 2.0' TO 3.0' BELOW MUCK

EXHIBIT #5 Defendant

CDF003798

FIGURE 1: LAGOON #1 SITE PLAN

LAB ANALYSIS SUMMARY

	Sample # / Parameter	W-1	1	4	5	6	Regulatory Limit
MISCELLANEOUS	Reactive Cyanide (ppm)	<0.5	<0.5	<0.5	<0.5	<0.5	
	Reactive Sulfur (ppm)	<25	<25	<25	<25	<25	
	Flash Point (°F)	97	>140	>140	>140	>140	
	pH	6.63	7.31	7.12	7.46	7.67	
	Free Liquid (%)	0	0	0	0	0	1=, 20
	TPH (418.1) (ppm)	1510	1543	25,557	81,426	105,290	100
	DRO (8015) (ppm)	38	35	216	54	94	
	PCB's (ppm)	<2	<2	<2	<2	<2	
TCLP BNA	Cresols (ppm)	0.10	<0.02	0.13	<0.02	0.07	200
	1, 4-Dichlorobenzene	<0.02	<0.02	<0.02	<0.02	0.03	7.5
	2, 4-Dinitrotoluene	<0.02	<0.02	<0.02	0.04	<0.02	0.13
	Hexachlorobenzene	<0.02	<0.02	<0.02	0.05	0.02	0.13
	Hexachloro-1, 3-butadiene	<0.015	0.50	<.02	0.02	0.08	0.5
	Nitrobenzene	<0.02	<0.02	<0.02	<0.02	0.38	2
	Pentachlorophenol	0.07	0.07	<0.05	<0.05	0.10	100
	Pyridine	<0.05	<0.05	<0.05	<0.05	<.05	5
	2, 4, 5 Trichlorophenol	<0.05	<0.05	<0.05	<0.05	<.05	400
	2, 4, 6 Trichlorophenol	<0.05	<0.05	<0.05	<0.05	<.05	2
	Hexachloroethane	<0.02	<0.02	0.03	<0.02	0.05	3
TCLP VOLATILES	Benzene	<0.05	<0.05	<0.05	<0.05	<0.05	0.5
	Carbon Tetrachloride	<0.05	<0.05	<0.05	<0.05	<0.05	0.5
	Chlorobenzene	<0.05	<0.05	<0.05	<0.05	<0.05	100
	Chloroform	<0.05	<0.05	<0.05	<0.05	<0.05	6
	1, 2-Dichloroethane	<0.05	<0.05	<0.05	<0.05	<0.05	0.5
	1, 1-Dichloroethane	<0.05	<0.05	<0.05	<0.05	<0.05	0.7
	2-Butanone (MEK)	<.5	<.5	<.5	<.5	<.5	200
	Tetrachloroethene	<0.05	<0.05	<0.05	<0.05	<0.05	0.7
	Trichloroethene	<0.05	<0.05	<0.05	<0.05	<0.05	0.5
	Vinyl Chloride	<0.05	<0.05	<0.05	<0.05	<0.05	0.2
TCLP METALS	Silver	<0.01	<0.01	<0.01	<0.01	<0.01	5
	Lead	<0.1	<0.1	<0.1	<0.1	1.0	5
	Cadmium	<.005	<.005	<.005	<.005	<.005	1
	Chromium	<0.05	<0.05	<0.05	<0.05	<0.05	5
	Aersenic	<0.001	0.003	0.008	<0.01	<0.001	5
	Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.2
	Barium	1.5	<0.1	<0.1	23	15	100
	Selenium	0.0005	0.03	<0.002	<0.002	<0.002	1

EXPERIENCE AND EQUIPMENT QUESTIONNAIRE

The signatory of this proposal guarantees the truth and accuracy of all statements and of all answers to interrogatories hereinafter made.

1. How many years have you been in business as a General Contractor under you present business name? 4 (Since 1991)

2. How many years have you been in principal officer of a general contracting firm under another name? -

3. What projects of a similar nature has your organization completed? *Client confidentiali prevents The Critter Company from disclosing site specific information.

(Note: Fill out each blank completely)

**References have been provided at the bottom of this sheet.

Name of Owner and Location	Name and Address of Person in Responsible Charge as Reference	Class of Work	Amount of Contract	Date of Completion

1) Ms. Jean Reynolds (602) 287-8702
2) Mr. Frank Caraisti (602) 577-7000
3) Mr. Rick Clark (602) 325-8852
4) Mr. Jerry Miller (304) 748-8181

*Please see attached Statement of Qualifications for list of sites clea

w:\rons\specques

ve you, or your Company, or any organization of which you have been a responsible ficer or agent, ever failed to complete any work awarded to you? If so, where and why?

p.

he work awarded or to be awarded will have the personal supervision of whom?

. Jerry Coon of The Critter Company, Inc.

ety

Explain approximately your plan and layout for performing the proposed work.

he Critter Company, Inc. will oversee the construction of a biocell
iat will encompass approximately 3 acres located between lagoons 2 and 3.
ie biocell will be constructed with on-site clean material. A 3' wide
nd 3' high dike will be built around the entire treatment cell.
xcavated sludge from the two lagoons will be placed into the biocell.
he sludge will be spread to a thickness of 12" to 20" depending on
oil conditions. A heavy inoculation of microorganisms will be sprayed
n the bottom of the biocell prior to contaminated soil being spread in
he treatment cell. The contaminated soil will be sprayed and tilled
n a weekly or by-weekly basis until contamination levels have reached
losure levels. Lagoon bottoms will also be lined with microorganisms
fter material has been 19 excavated.

w:\rene\specques

THE CRITTER COMPANY
Biological Remediation of Hydrocarbons

STATEMENT OF QUALIFICATIONS

3/95

THE COMPANY

THE CRITTER COMPANY Inc. (TCC) is an environmental service company specializing in biological remediation of hazardous wastes. TCC was established in 1991 as a venture combining technical experts in the field of applied bioremediation with engineering and business professionals. TCC is engaged in research, development, and commercial applications of micro biological technologies that use mixtures of naturally occurring microorganisms in conjunction with a unique proprietary biocatalyst to accelerate the biodegradation of organic waste. In addition, TCC has researched the industry and aligned itself with the best research and implementation firms available to bring bioremediation to the public. TCC has successfully treated a variety of contaminated sites nationwide. We currently have 3 regional offices providing prompt mobilization to all areas of the United States.

BIOREMEDIATION

BIOREMEDIATION is a proven, cost-effective solution to cleaning up contaminated soil and water sites. Major oil companies and EPA superfund sites have been successfully using bioremediation for years. The technologies developed for these major sites has many practical applications and is now considered as the preferred method to treat contamination. THE BIOREMEDIATION PROCESS incorporates naturally occurring microorganisms that have been screened and cultivated for their ability to rapidly degrade a wide variety of hazardous materials. In many cases, sites are cleaned to acceptable levels in as little as 3 or 4 weeks. In short, the process allows man to "speed up" nature. The process will convert hazardous hydrocarbon waste to carbon dioxide, water, and other biologically accepted intermediate organic waste. When hydrocarbons are degraded, the soil will convert to an activated condition, suitable for normal use. The microbial population will decline as hydrocarbon foodstuff is reduced. The effected ecosystem will eventually return to its natural microbial base level.

Both the microbes and biocatalyst are natural products and present no danger to the environment or human health. THE BIOREMEDIATION PROCESS is the leading edge of scientific efforts to restore polluted environments to their natural state in the best way possible, ***using natural methods***.

6890 E SUNRISE DRIVE #120-10 • TUCSON ARIZONA 85715 • (520) 299-9808

Portfolio of Services

—**State/EPA Compliance Consulting:** Assurance Funds applications and Pre-approval applications

—***Insitu* applications:** In situations where soil removal is impractical, bioremediation can be used to treat the contaminate in place without disturbing the site. Ground water can also be treated with a pump and treat method.

—**Above ground soil clean-up:** Contaminated soil stored above ground can be quickly degraded using bioremediation. A large variety of contaminates including diesel, gasoline, waste oil, creosote, and other organic wastes can be degraded on site at a fraction of the cost of other types of treatment.

—**Oil Spills:** Lagoons, lakes, lake beds, shorelines, and ponds can be treated with a minimum of equipment.

—**Storage Tanks:** Oil crust, sludge, and other residue can be eliminated by the use of bioremediation. Bilge water ballast can be cleaned in the tank thus eliminating contaminated discharges.

—**Manufacturing Plants:** Cutting oils, solvents, pipe thread dope, hydraulic oil, diesel, etc. can accumulate in the soil in and around industrial sites. Bioremediation can eliminate the organic wastes and confine hauling cost to metals and inorganic matters.

—**Waste Water Treatment Plants:** Bioremediation aids in reducing the volume of sludge and improves settling in treatment plants. Results have demonstrated less odor, quicker recovery from overloads, and improved efficiency. Electrical and material savings are also achieved.

—**Bio-reactor:** Systems are available to treat groundwater, organic pollutants, and oily liquids on site prior to discharge into the sewage system.

—**Oil Well Secondary and Tertiary Recovery:** Older wells can become more productive by using bioremediation to separate oil from the soil, using the fatty acids produced to solubilize the oil: and control paraffin buildup.

KEY PERSONNEL

The management team consists of men and women whose backgrounds include years of effective marketing , corporate development, scientific, political, and administrative work.

Jeremy W. Coon, President, CEO. Company founder Mr. Coon has successfully treated contaminated sites in AZ, CA, KY, OH, & NM. Established national marketing network. Is on site in nearly all applications. Has assembled a team of world class microbiologists and is continually improving treatment techniques to lead the market in innovative, cost effective procedures. B.A. Yale, M.B.A Northwestern.

Byron F. Bennett, Vice-President Project Management and Coordinator. Superior field management skills. Currently supervising clean-up on 40,000 cubic yard project. B.S. Business Administration, Morningside College.

Rex Jonathan Beving, Project Planning and Adminstration, Cost Controls and Field Safety Management. B.S. Industrial Adminstration, Iowa State University.

Scott Klingensmith, Project Management and Coordinator. In charge of all Ohio activities. Field experience in application techniques. B.S. Business Comm, Otterbein College

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James Waskovsky is now recognized as a world class expert in the isolation of bacteria that digests synthetic petroleum and heavy crude. His isolation techniques relating to bioremediation bacteria offers startling and unprecedented solutions to difficult problems which greatly reduce the degradation time process from months to weeks. He holds patents and has published technical articles on commercialization techniques for bioremediation.

Consulting Staff Worldwide

SUMMARY OF PROJECTS

The following is a brief summary of some of our recent projects:

Arizona:

√ Copper Mine. - Soil contaminated with diesel and waste oil. TPH levels up to 75,000 ppm. Reduced to 100 ppm in 8 weeks. Fifth batch for same client underway.

√ Copper Mine. - 50,000 tons of soil contaminated with fuel, diesel, waste oils, and lubes, TPH levels to 220,000 ppm. Treatment in process.

√ Construction Yard - Soil with motor oil levels of 8900 ppm down to under 50 ppm in 30 days.

√ Construction Yard - Soil diesel fuel spill, TPH at 4900 ppm reduced to under 50 ppm in 8 weeks.

√ Service station - Bench study in-situ (in place) injected microbes into soil with TPH levels at 7,000 ppm. Down to 350 ppm in 5 weeks.

√ Farm - Soil with diesel levels 800 -1200 ppm, reduced to N/D in five weeks.

√ Circle K - Gasoline contaminated soil (980 ppm) treated in stockpiles 5 ft. high due to limited space. Reduced to N/D in 6 weeks.

√ Residencial House basement - Fuel oil leaking tank, Insitu application

California:

√ Industrial Site - Soil contaminated with diesel, gasoline, and motor oils. TPH prior to treatment 5,000 ppm, thirty-five days thereafter levels below 500 ppm and closed.

√ Gas Station - Clay soil contaminated with waste oil levels up to 5,000 ppm. Two months after treatment began, TPH levels were reduced by 90% and the site submitted for closure.

√ Industrial Harbor. Bench study Silty clay sludge from TPH of 11,400 ppm to 37 ppm in 22 days.

√ Country Club maintenance facility - In-situ treatment with injection wells, under contract.

√ School District Maintenance Facility - Sandy Clay - Gasoline. 1500 cu. yds. Cleaned in 45 days.

√ Trucking yard. Bench study took soil from 6500 to 600 ppm in 10 days.

√ Resort/Marina In-situ treatment under parking garage. 2,500 cu. yds. diesel with levels up to 68,000 ppm.

√ Car Wash In-situ with injection wells. Under contract.

√ Industrial building, In-situ treatment with infiltration gallery under contract.

Nevada:

√ Service Station - 3,000 cu. yds. In-situ using infiltration gallery and bio-venting.

New Mexico:

√ Oil Field Production Pits - 2 well pits in progress.

Kentucky:

√ Oil Storage Tanks. Cleaned residue, in below freezing temperature, in three months.

Ohio:

√ Piping Company - LUST, Diesel, 5000 ppm, insitu, week seven 467 ppm

√ Parts Store - Spill, Motor oil, 18000 ppm, 1000 cubic yards, insitu, trenches

FOR ADDITIONAL INFORMATION CONTACT:

THE CRITTER COMPANY Inc
6890 East Sunrise Drive #120-10
Tucson Arizona 85715

Telephone: (520)-299-9808

THE BIOREMEDIATION PROCESS
A Practical Guideline

The following information is provided by THE CRITTER COMPANY Inc. (TCC) as an overview of the science of bioremediation. The information presented is taken from our experiences and from information provided by Dr. Carl Oppenheimer, the microbiologist affiliated with TCC.

Bioremediation is based on the concept that nature provides a mechanism for naturally recycling all organic material. Applied microbial bioremediation helps nature along by isolating specific organic degrading microbes, cultivating a large quantity and introducing them to the contaminated medium with proper amounts of nutrients and oxygen to dramatically accelerate the degradation process.

Applied microbial bioremediation can use either naturally occurring microbes or genetically engineered microbes (GEM's) or pathogens. ***The Critter Company and this article only deals with naturally occurring microbes.***

The Microbe:

Bacteria are the earth's primitive single celled organisms. Their basic role is to recycle the components of living organisms, converting them to the nutrient chemicals used by plants in photosynthesis and chemosynthesis. The bacteria have an average size of one micron, a 10,000th of a centimeter or 25,000th of an inch. More than 3000 species of bacteria have been identified and many more that are still unknown.

Their size makes the microbe one of the smallest living units that contain the necessary complex chemicals for life processes and the necessary enzymes for their role in recycling complex organic matter. These small cells, by design, have large surface to volume ration which permits a maximum cell wall chemical activity and interchange of materials unto and out of the cells.

Each molecule that is produced by life is decomposed either during metabolism of higher organisms including plants, or recycled by microorganisms. The goal of nature's recycling is to release their elements back to the inorganic components, to be utilized again by plants and animals.

The design of our earth and living forms has a balance, or equilibrium, dictated by the laws of physics and chemistry, geological structures and the composition of plants and animals. The microbe fits into this balance by its small size, great tolerance for variations of temperature, water availability, concentration of materials and the necessary enzymes to recycle all the 6 million chemical organic compounds produced as a part of life.

Application:

Obviously, because of the many complex interrelationships between microorganisms and their environment, each site requires a separate approach. The primary object is to bring an inoculate of specific microorganisms, water, oxygen and nutrients into contact with the contaminated material.

For microbial enzymes to be functional there must be a contact between the microbial cell and the hydrocarbon molecule. The bioengineering of any site selected must included a place at the atomic level, at the interface between microorganisms and surfaces. This atomic oxygen is very difficult to measure. Evidence of activity is generally determined by an increase in biological activity.

In the presence of the biocatalyst, microbial populations exceed those produced by normal oxygenation and nutrients. Laboratory and field test show a thousand fold increase in cell mass of microorganisms cultivated in the presence of the biocatalyst. In addition there is laboratory evidence that the biocatalyst accelerates growth in minimal oxygenated media. Aerobic growth can proceed at a more rapid rate suggesting that oxygen is available.

The biocatalyst in sediments could produce micro amounts of available atomic oxygen even under anaerobic conditions. This effect may be responsible for the successful use of facultative aerobes in microbial enhanced oil recovery where our microorganisms with catalyst was effective in increasing the yield of many low producing oil wells.

The use of an oxygen producing biocatalyst opens a new era of applied bioremediation in ground waters and soil where oxygen is at a minimum.

Toxicity:

Toxic materials include inorganic or organic compounds that will kill or inhibit a part or all the microorganisms. The complexity of the environment requires a compatibility test for each application.

Temperature:

Microorganisms are active in temperatures from freezing to 70 C. Normally activity is closely related to temperature increase. There is evidence that biological activity is stimulated by infra red radiation. In some cold environments it is possible to increase the biological activity by modifying a greenhouse effect.

Summary:

The rate of bioremediation will be relative to the concentration of hydrocarbons in the original site and the ability to provide optimal environmental conditions for microbial growth. Applied bioremediation does not consist only of the addition of microorganisms or the addition only of nutrients. The total environmental system, as related to the size and properties of the microbial amendment, must be considered. If any of the four basic requirements listed above are missing, then the process will not be efficient or may not take place. In addition, other properties such as soil types, soil chemistry, organic content, toxic materials, temperature, etc., are also important parameters, and as such must also be considered. Bioremediation is an efficient and cost effective way to treat contaminated soils and groundwater. The key is to understand the microbiology and geology of the site and design an inoculant and distribution system to account for those conditions.

Distribution in Nature

Since the primary responsibility of microorganisms is to recycle organic material, and since the total biological protoplasm is relatively constant for any ecological system, bacteria of a wide variety of species must be present in sufficient quantities and diversity in all environments to recycle the organic material, both natural and man made.

Bacteria, because of their small size are readily distributed through out the earth's surface. They are transferred by wind into the atmosphere to heights of 80,000 feet in dust, in water currents carry microbes into the deepest ocean channels. Microorganism have been found at the base of the deepest oil wells. It is estimated that an adult human may have as many as 3 pounds of bacteria on the skin and internal organs. These organisms continuously add to the surrounding environment.

Microorganisms have many other properties that characterize their role as mineralizers. They have a ability to form resting cells in times when food is not available. When environmental conditions become favorable, these resting cells can rapidly infiltrate the environment to fulfill their basic role in recycling organic matter. In soils, microorganisms are readily transported by water movement over long distances both down and through geological formations. In fact much of the weathering of rocks and soils are carried out by microbial activities. Oil, gas and coal are the products of living organisms trapped in geological formations.

The patterns of the distribution of soil and water microorganisms are more complex than stated above. However one can realize that nature developed a tremendous capability of producing and continually distributing a large population of these small very active and mobile single celled organisms. The Microbes have the basic responsibility to restore the environment wherever natural or man made pollutants are in excess. When pollutants are in excess of natural microbial recycling, the bacteria will continue to work but take longer than man is willing to wait. For this state of unbalance, man has coined the word pollution.

Bioremediation:

Applied Microbial Bioremediation is a relatively new term used to describe the enhanced recycling of human, industrial and agricultural wastes. The natural process can be accelerated by the application of selected microbial populations designed to supplement the natural microorganisms and thus direct their activity.

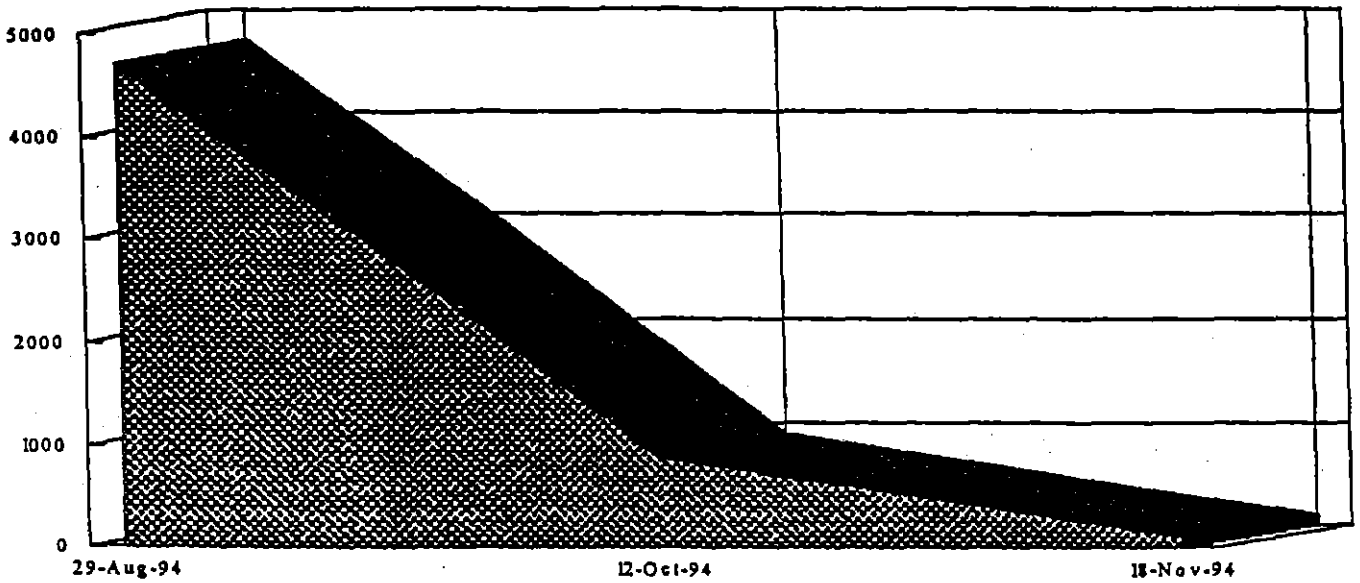
Applied microbial bioremediation therefore is a process where massive numbers of selected microorganisms are introduced into contaminated soil or water. The organisms are carefully selected for their ability to degrade contaminated materials to harmless by-products and to use this process for growth and energy. These microorganisms will supplement and associate with Indigenous microorganisms and through the proper application, the versatile mixture can materially enhance the normal cycles present in the environment.

Bioremediation with such specially selected mixtures of microorganisms can be used in-situ, in special reactors, on surface water or soil. The application methodology is dictated by the conditions of the general ecology of the area and the chemistry and concentrations of the contaminating material to be recycled.

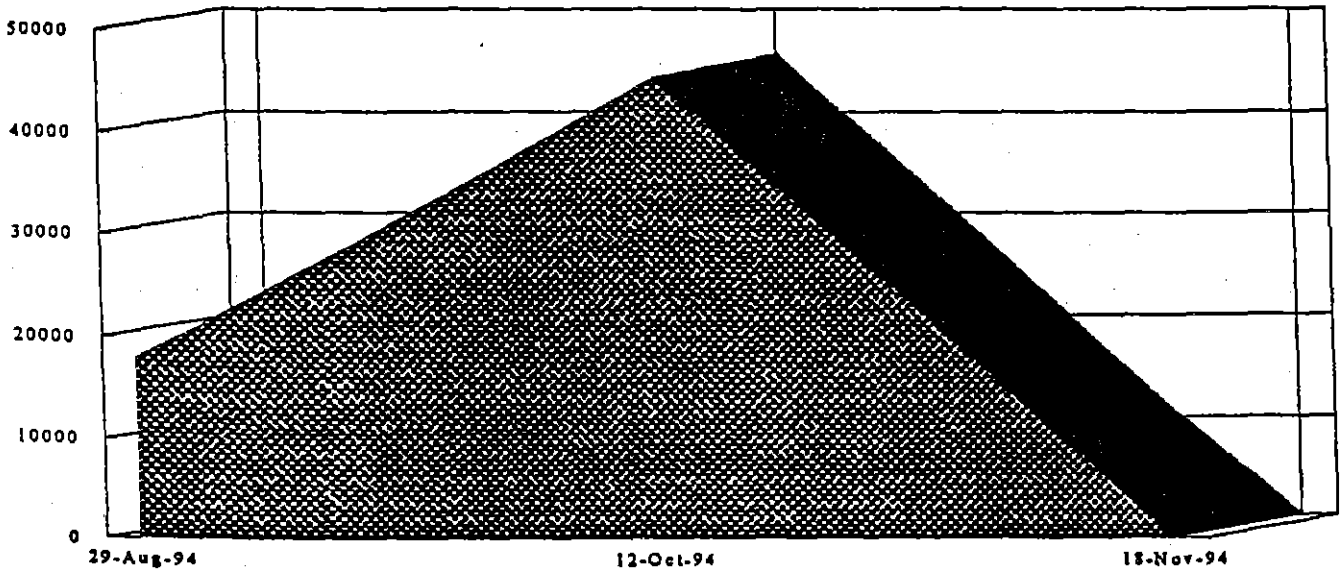
ATTACHED ARE SEVERAL CASE HISTORIES OF SUCCESSFUL BIOREMEDIATION PROJECTS.

ADDITIONAL CASE STUDIES AND DATA ARE AVAILABLE UPON REQUEST.

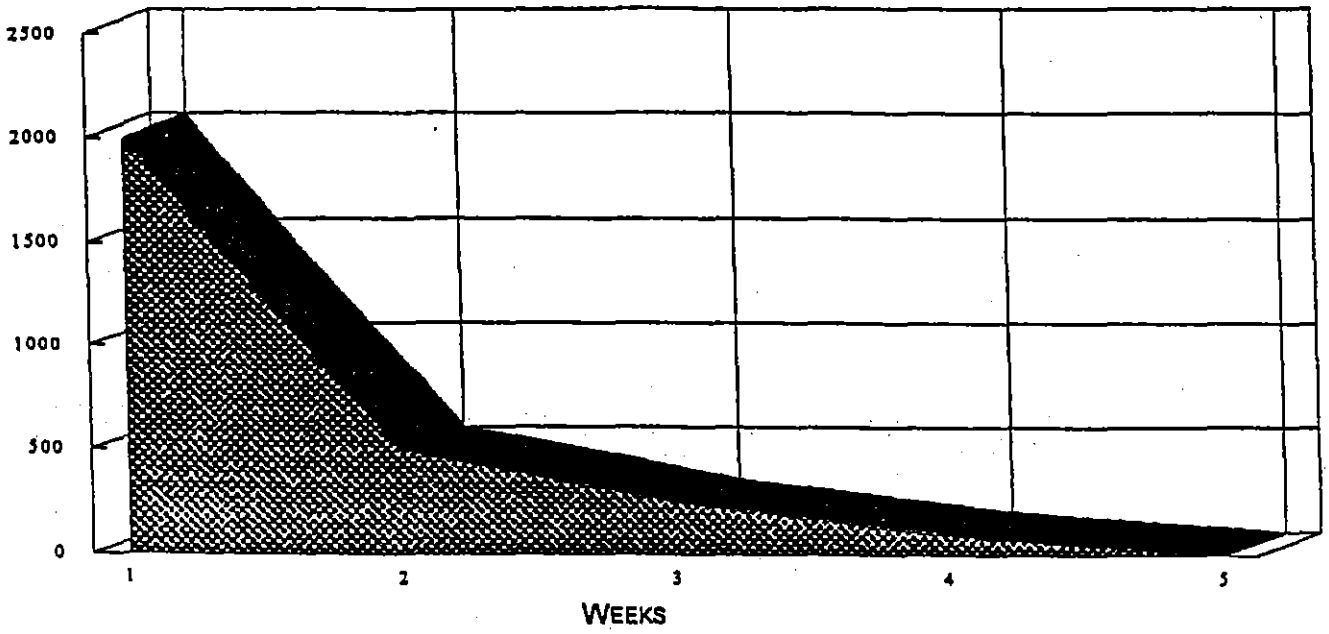
CLIENT CONFIDENTIALLY PREVENTS US FROM DISCLOSING SPECIFIC SITE INFORMATION



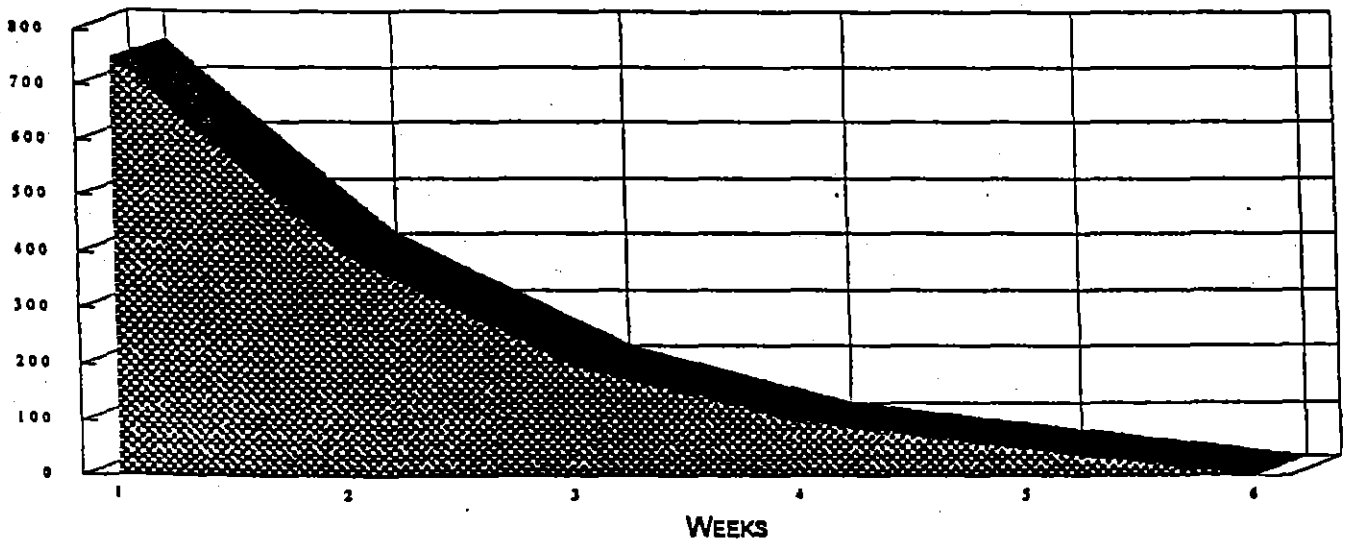
- LOCATION:
  NORTHERN ARIZONA
  COPPER MINE
- SOURCE OF CONTAMINATION:
  EQUIPMENT & TRUCK WASH RESIDUE
- TYPE OF CONTAMINATION & LEVELS:
  GAS & DIESEL 4700 PPM
- QUANTITY & TYPE OF MATERIALS
  4000 CU YDS - SAND, CLAY
- TREATMENT METHOD:
  LANDFARM



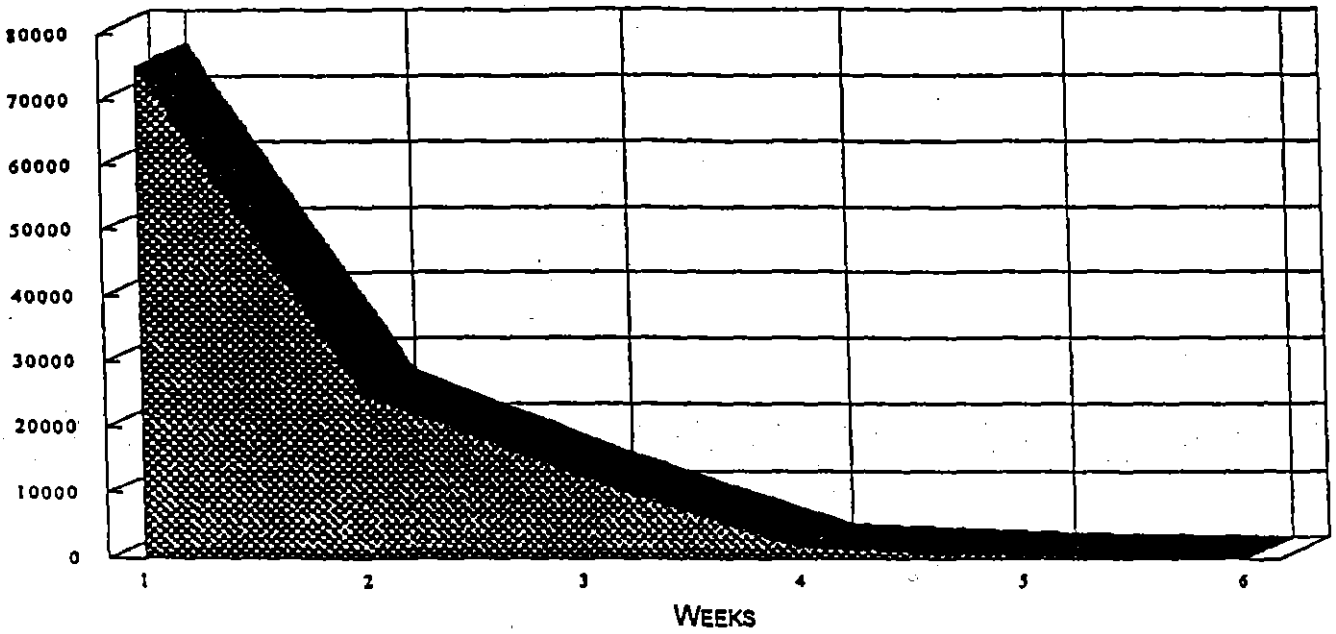
- LOCATION:
  NORTHERN ARIZONA
  COPPER MINE
- SOURCE OF CONTAMINATION:
  EQUIPMENT & TRUCK WASH RESIDUE
- TYPE OF CONTAMINATION & LEVELS:
  HEAVY MOTOR OIL 18,000 PPM
- QUANTITY & TYPE OF MATERIALS:
  4000 CU YDS - SAND, CLAY
- TREATMENT METHOD:
  LANDFARM



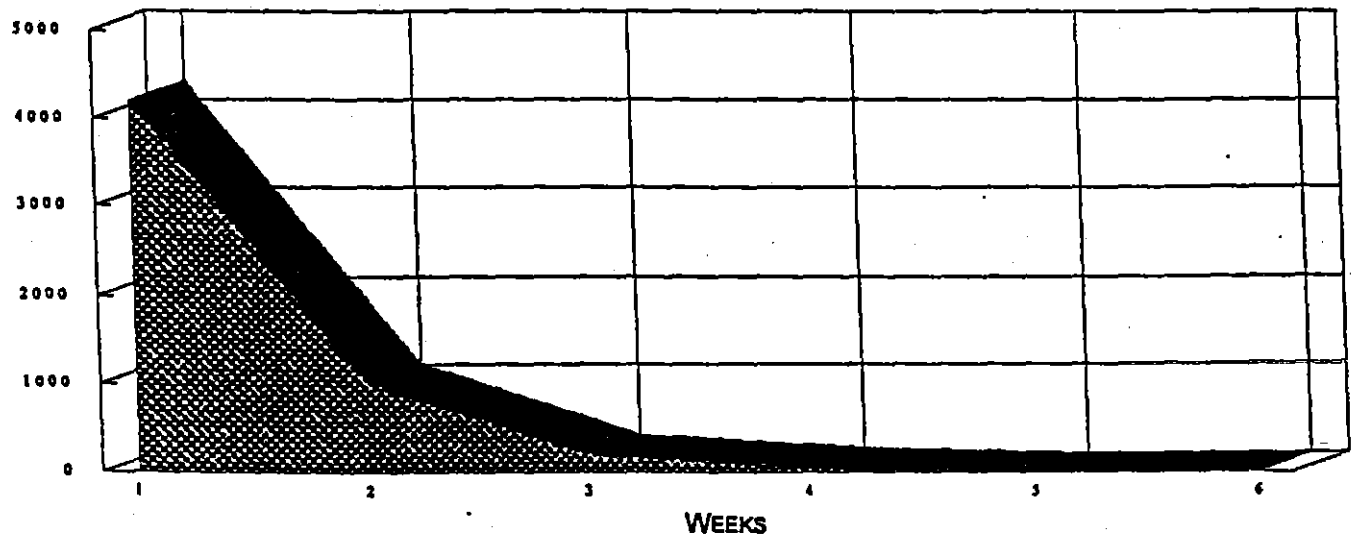
- LOCATION:
  BALDWIN PARK, CALIFORNIA
  SERVICE STATION
- SOURCE OF CONTAMINATION:
  LEAKING UNDERGROUND TANK
- TYPE OF CONTAMINATION & LEVELS:
  GASOLINE - 2000 PPM
- QUANTITY & TYPE OF MATERIALS
  200 CU YDS - SAND
- TREATMENT METHOD:
  18" LANDFARM



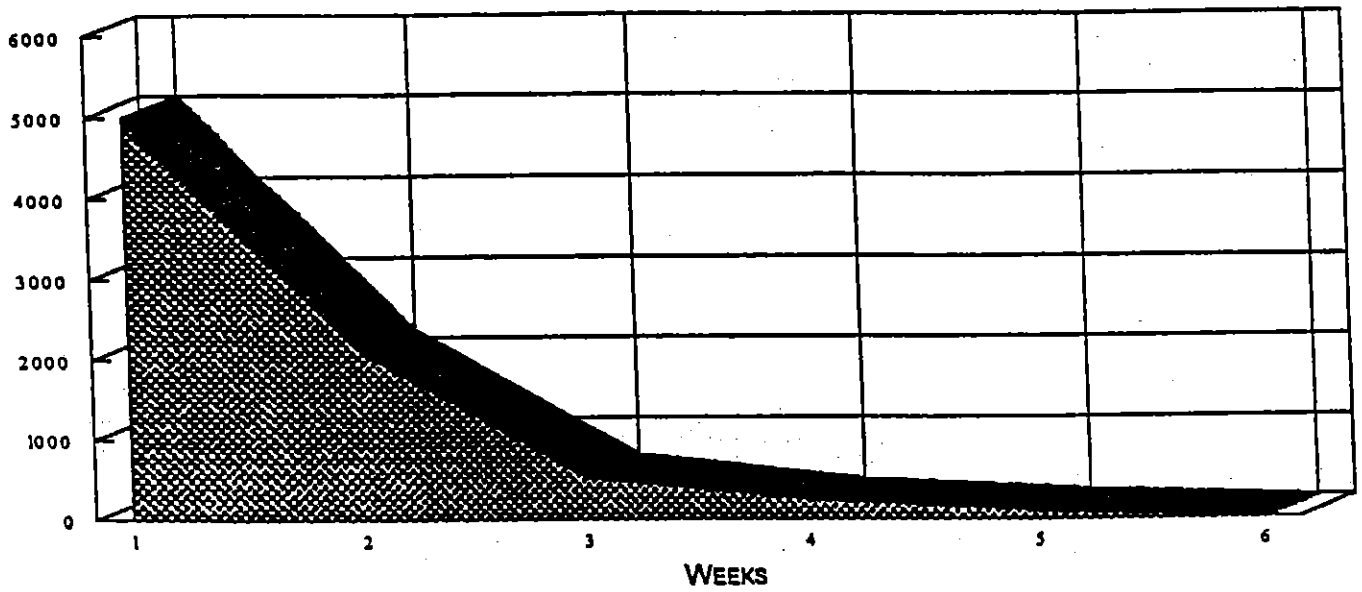
- LOCATION:
  LA HABRA, CALIFORNIA
  MAINTENANCE FACILITY
- SOURCE OF CONTAMINATION:
  LEAKING UNDERGROUND TANKS
- TYPE OF CONTAMINATION & LEVELS:
  DIESEL & GASOLINE 750 PPM
- QUANTITY & TYPE OF MATERIALS:
  1500 CU YDS - SILTY CLAY
- TREATMENT METHOD:
  18" LANDFARM



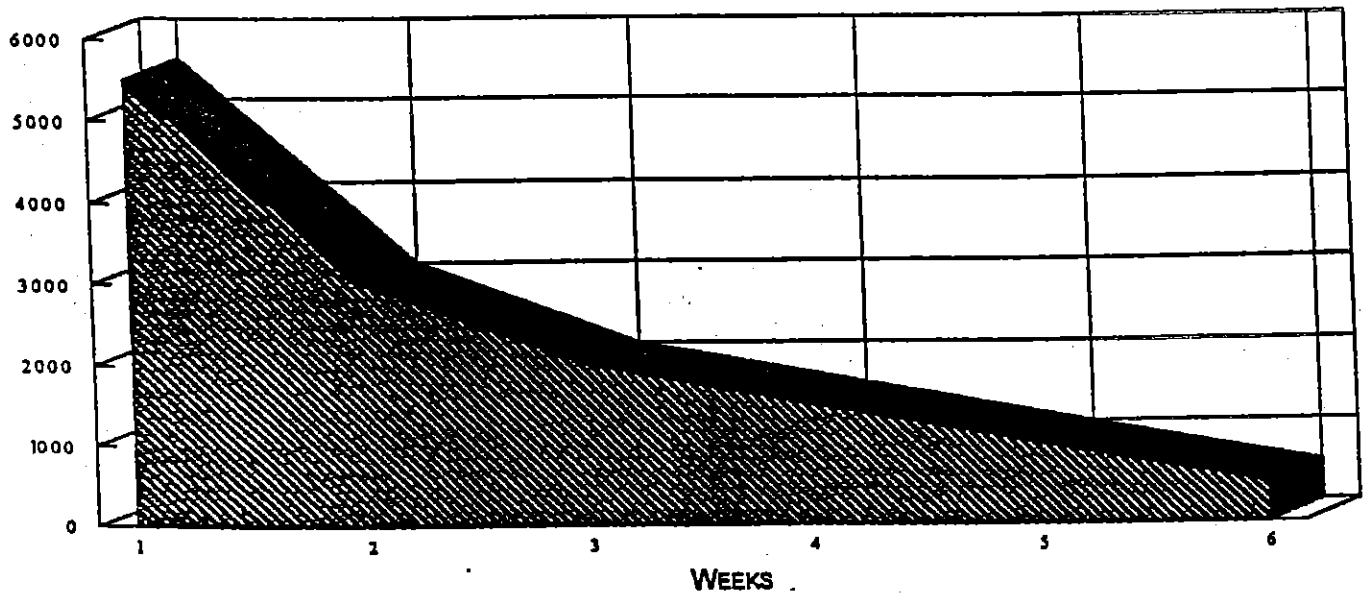
- **LOCATION:**
  SOUTHERN ARIZONA
  MINING SITE
- **SOURCE OF CONTAMINATION:**
  REFUELING FACILITY
- **TYPE OF CONTAMINATION & LEVELS:**
  DIESEL - 75,000 PPM
- **QUANTITY & TYPE OF MATERIALS**
  450 CU YDS - SOIL & ROCK
- **TREATMENT METHOD:**
  IN PLACE



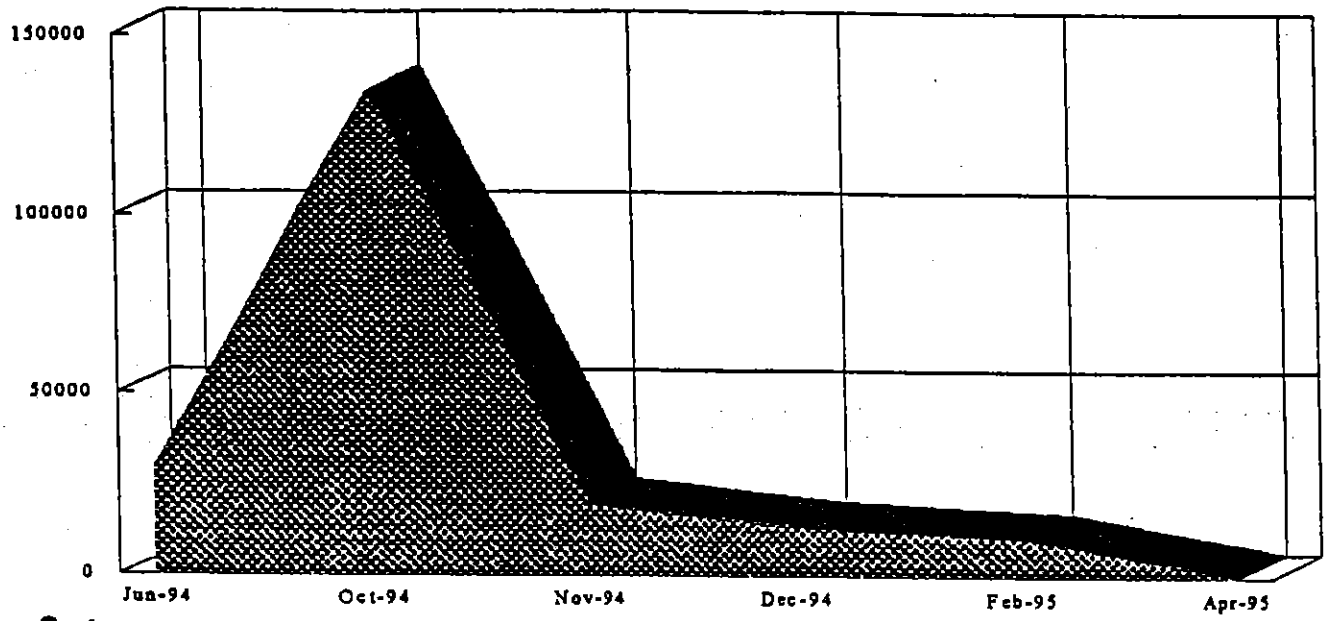
- **LOCATION:**
  TUCSON, ARIZONA
  ENGINE REBUILDER/AUTO SERVICE
- **SOURCE OF CONTAMINATION:**
  SURFACE SPILLS
- **TYPE OF CONTAMINATION & LEVELS:**
  WASTE OIL - 4200 PPM
- **QUANTITY & TYPE OF MATERIALS:**
  100 CU YDS - SILTY CLAY
- **TREATMENT METHOD:**
  IN PLACE



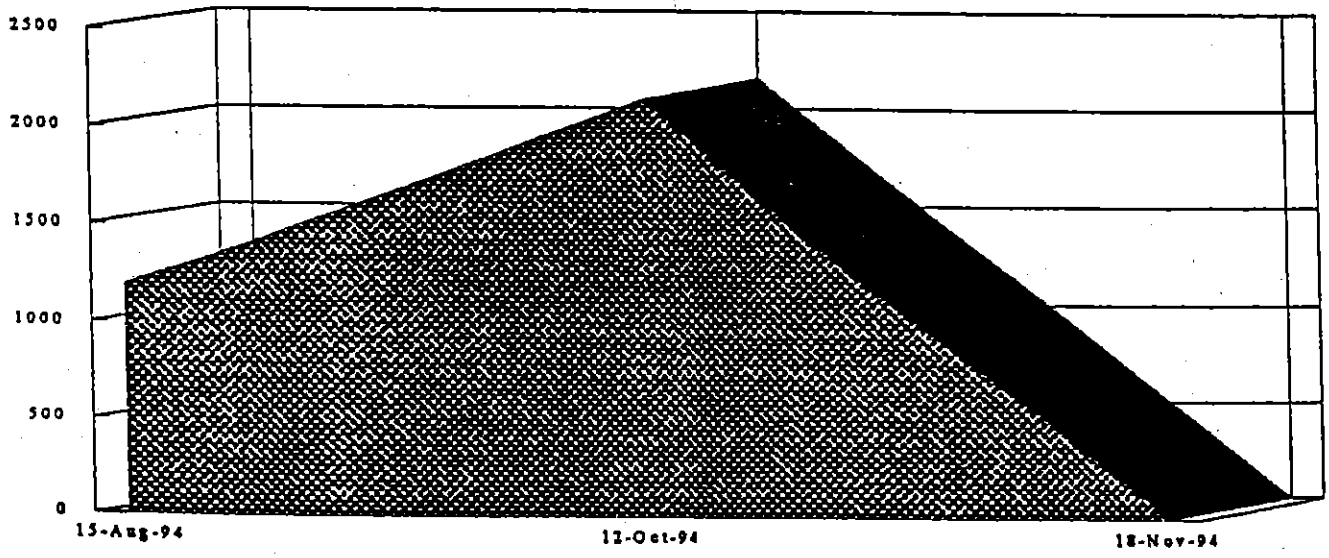
- LOCATION:
  SANTA FE SPRINGS, CALIFORNIA
  INDUSTRIAL SITE
- SOURCE OF CONTAMINATION:
  HEAVY EQUIPMENT SERVICING
- TYPE OF CONTAMINATION & LEVELS:
  DIESEL & WASTE OIL 5000 PPM
- QUANTITY & TYPE OF MATERIALS
  125 CU YDS - SANDY CLAY
- TREATMENT METHOD:
  36" STATIC PILE



- LOCATION:
  SAN DIEGO, CALIFORNIA
  SERVICE STATION
- SOURCE OF CONTAMINATION:
  LEAKING UNDERGROUND TANKS
- TYPE OF CONTAMINATION & LEVELS:
  DIESEL & WASTE OIL 5500 PPM
- QUANTITY & TYPE OF MATERIALS:
  125 CU YDS - SILTY CLAY
- TREATMENT METHOD:
  18" LANDFARM



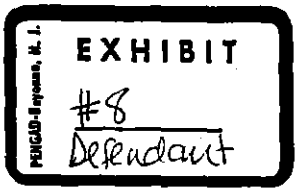
- **LOCATION:**
  CENTRAL OHIO
  MANUFACTURING YARD
- **SOURCE OF CONTAMINATION:**
  MANUFACTURING PROCESS
- **TYPE OF CONTAMINATION & LEVELS:**
  PARAFFINIC OIL 30000 PPM
- **QUANTITY & TYPE OF MATERIALS**
  4000 CU YDS - GRAVEL, CLAY
- **TREATMENT METHOD:**
  LANDFARM



- **LOCATION:**
  NORTHERN ARIZONA
  COPPER MINE
- **SOURCE OF CONTAMINATION:**
  EQUIPMENT & TRUCK WASH RESIDUE
- **TYPE OF CONTAMINATION & LEVELS:**
  HEAVY MOTOR OIL 1200 PPM
- **QUANTITY & TYPE OF MATERIALS:**
  4000 CU YDS - SAND, CLAY
- **TREATMENT METHOD:**
  LANDFARM

THE CRITTER COMPANY
Biological Remediation of Hydrocarbons

4725 E. Sunrise Drive #412 Tucson, Arizona 85718 (602) 299-9808



January 6, 1995

Mr. Gene Hill
Hammontree & Associates, LTD.
5233 Stoneham Rd.
North Canton, Ohio 44720

RE: Bioremediation proposal to treat approximately 3000 cubic yards.

Dear Mr. Hill,

THE CRITTER COMPANY INC. (TCC) is pleased to submit this proposal for the bioremediation of contaminated soil at your site in Canton, Ohio. Our proposal is based on using naturally occurring microorganisms to breakdown the hydrocarbon contamination into harmless fatty acids, water, and carbon dioxide. TCC will augment the contaminated soil with microbes specifically selected for their ability to degrade petroleum. TCC will manufacture the microbial product in quantities required to treat the subject site. By controlling the manufacturing process, we insure that the plate count (microbes per gram) is maximized and degradation is accelerated.

Attached is a scope of work describing the proposed treatment process. If this proposal is accepted, TCC will bioengineer the system to address specific site conditions in detail.

This proposal is subject to the following:

TERMS & CONDITIONS:

1. A treatability study that shows our process will effectively degrade the contaminant.
2. This proposal is based on treating approximately 3000 cubic yards.
3. **TCC will be responsible for the following:**
   a. Treatability study.
   b. Bioengineering services.
   c. All site preparation for treatment.
   d. Labor and material for inoculating the soil.
   e. All earthmoving and watering during project.
   f. Reports and documentation procedure.

IAH

4. **Hammontree & Associates is responsible for the following:**
   a. Access to treatment area.
   b. Continuous water supply to the treatment area.
   c. Soil testing including beginning, intermediate, and confirmation samples upon completion of project.
   d. Permitting (If required).

PRICE QUOTATION: $69,000

1. Payment of $1,000 due upon acceptance of proposal.
2. 50% of balance ($34,000) due at time of first inoculation.
3. Remainder of balance ($34,000) due when the levels of contamination have reached closure levels.
4. Any substantial increase to the amount of contaminated soil will be billed at $23 per cubic yard.
5. Price quotation includes total cost for The Critter Company regardless of project length or number of treatments.
6. Price quotation good for 90 days (April 6, 1995).

If you have any questions or need additional information, please do not hesitate to call me at (614) 431-8190 or Jerry Coon at (602) 299-9808. If this proposal is acceptable, please sign and return one copy.

Sincerely,
THE CRITTER COMPANY, INC.

Scott Klingensmith

Scott Klingensmith
Project Coordinator

Accepted By: _____

Signature: _____

Title: _____

Date: _____

Exhibits: Scope of Work

THE CRITTER COMPANY
Biological Remediation of Hydrocarbons

6890 E. Sunrise Drive, #120-10 Tucson, Arizona 85715 (520) 299-9808

EXHIBIT #9 Defendant

April 28, 1995

Mr. Keith Houseknect
Canton Drop Forge
4575 Southway Street, S.W.
P.O. Box 6902
Canton, Ohio 44706

RE: Revised proposal for treating 9,000 cubic yards of sludge.

Dear Mr. Houseknect,

Pursuant to our conversation on Wednesday, April 26, 1995 and my conversation with Mr. Gene Hill of Hammontree & Associates on that same day, The Critter Company is proposing to biologically remediate sludge material found in lagoons 1 and 2. The Critter Company proposes to split excavating and bioremediation activities into two separate payment schedules for Canton Drop Forge. The Critter Company proposes the following:

PHASE I. (Excavating of material and building biocell)

1) The Critter Company will recommend an excavator to remove sludge from lagoons 1 and 2.

2) If necessary, the excavator will provide bonding to Canton Drop Forge.

3) The excavator will be paid directly by Canton Drop Forge for work completed.

PHASE II. (Bioremediation and maintenance of biocell)

1) The Critter Company will oversee construction of the biocell.

2) The Critter Company will inoculate the biocell and lagoon linings with microorganisms specifically grown and cultivated for this site.

3) The Critter Company will be responsible for all treatments and tilling of soil on a weekly or by-weekly schedule in the months of April-October.

4) The Critter Company will continue to treat until a composite sample reaches 380 ppm or less of total petroleum hydrocarbons.

5) The Critter Company will be paid by Canton Drop Forge based on performance of reducing contamination levels.

6) The Critter Company and Canton Drop Forge will mutually agree on a payment schedule based on reduction of contamination levels.

Environmental Resources, Inc. and our parent company, The Critter Company, Inc. appreciate this opportunity to bid. Environmental Resources is currently licensed to do business in the State of Ohio. If chosen as the bioremediation contractor on this project, The Critter Company will register with the State of Ohio. The Critter Company carries 2 million dollars of liability insurance. All of our treatment specialists are OSHA 40-Hour Health and Safety trained. If you have any questions or need additional information, please feel free to contact me at (614) 431-8190, or Mr. Jerry Coon in our corporate headquarters at (800) 483-4284.

Sincerely,
THE CRITTER COMPANY, INC.

Scott Klingensmith

Scott Klingensmith
Project Coordinator

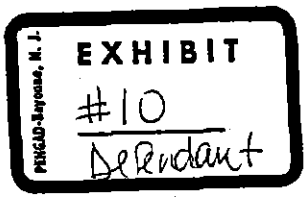
cc: [illegible]

THE CRITTER COMPANY

Biological Remediation of Hydrocarb[illegible]

6890 E. Sunrise Drive, #120-10 Tucson, Arizona 85715 (520) 299-9808

GGH



June 2, 1995

Mr. Gene Hill
Hammontree & Associates, LTD.
5233 Stoneham Rd.
North Canton, Ohio 44720

RE: Canton Drop Forge Bioremediation Project.

Dear Gene,

The following is a response to your comments and questions regarding the Canton Drop Forge bioremediation project as outlined in your letter on May 19, 1995.

1. TIME FRAME:

A. To better serve Canton Drop Forge, The Critter Company has already designed and manufactured over 200 lbs. of oil eating microbes to start this project. Additional microbes will be grown on-site throughout the duration of the project.

B. Upon signing of the contract, The Critter Company will have Beaver Excavating build the Bio-Cell. This will take 2 to 3 days. Work can commence within 5 days of signing of the contract.

C. The Critter Company will then seed the bottom of the Bio-Cell with nutrients and oil eating microbes prior to any material from Lagoons 1 or 2 entering the cell. Beaver Excavating will then proceed to excavate sludge material from Lagoon 1, transport material to the Bio-Cell, and spread it out over the Bio-Cell. It will take approximately 2 weeks to build the Bio-Cell and completely empty Lagoon 1.

D. If additional space exists in the Bio-Cell, The Critter Company, with permission from Canton Drop Forge, will have Beaver Excavating transport the material from Lagoon 2 into the Bio-Cell until it has reached full capacity. The Critter Company and Beaver Excavating estimate that no more than 4,500 cubic yards will fit into the Bio-Cell. Contaminated soils will be spread throughout the Bio-Cell at a depth of 18-22 inches. A 3 foot dike will be constructed around the entire cell to prevent run-off.

2. WORK PLAN & SCHEDULE:

A. Pumping - The Critter Company asks that Canton Drop Forge remove as much of the water from Lagoons 1 and 2 out as possible prior to Beaver Excavating removing sludge material.

B. Rain - Unless several inches of rain falls within a 24-48 hour period, we do not foresee weather adversely affecting removal of sludge.

C. Layout of Bio-Cell - The layout and location of the Bio-Cell will be dependent upon how much land can be allocated by Canton Drop Forge for this project. The Critter Company will ask Keith Houseknect or an other representative from Canton Drop Forge be on-site during the building of the Bio-Cell in order to mark boundaries for the excavation crew. Currently, several large pieces of CDF equipment occupy the space where the Bio-Cell will be constructed. Therefore, The Critter Company cannot outline the exact boundaries of the cell at this time. However, it is our understanding from Keith Houseknect that the cell can be constructed around each piece of equipment.

D. Time Frame:

-2 Weeks to build Bio-Cell and empty Lagoon 1 and part of Lagoon 2.
-Bioremediation treatments will be made approximately once a week.
-Tilling or turning over soil will be done approximately once a week.
-Sampling will be conducted once a month by Hammontree & Associates.
-Treatment process for the first 4,500 cubic yards should take between 3-6 months of warm weather.
-The second 4,500 cubic yards will follow the same schedule.

3. PERMITTING: Permitting will not be necessary for the bioremediation portion of this project.

4. BULKING: While The Critter Company does not anticipate to bulk any sludge material with native soils, we will need to add between 1/2 - 1 1/2 tons of a fertilizer and nutrient mixture.

5. SAMPLING AND ANALYSIS: The Critter Company requests that the EPA 418.1 method be run in conjunction with a GC method. We have two concerns about the 418.1 method. First, this method has a long history of yielding unpredictable and unreliable results. The Critter Company can provide documentation of the problems surrounding 418.1. Second, this method is expected to be abolished before the end of this project.

If you have any questions or need additional information, please do not hesitate to call me at (614) 431-8190 or Jerry Coon at (520) 299-9808.

Sincerely,
THE CRITTER COMPANY, INC.

Scott Klingensmith

Scott Klingensmith
Project Coordinator

R. JAMES HAMMONTREE, P.E., P.S.
BRUCE M. FAIR, P.E., P.S.
LAWRENCE D. PHILLIPS, P.E., P.S.
CHARLES F. HAMMONTREE, P.E., P.S.
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RICHARD R. COOK, P.E., P.S.
JAMES G. BOLLISON, P.E., P.S.
KEITH A. BENNETT, P.E., P.S.
BARBARA H. BENNETT, P.E., P.S.

HAMMONTREE & ASSOCIATES, LIMITED
Consulting Engineers · Planners · Surveyors

TREEMORE BUILDING
5233 STONEHAM ROAD
NORTH CANTON, OHIO 44720

PHONE (216) 499-8817
FAX (216) 499-0149
TOLL FREE 1-800-394-8817

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PAUL A. TOMIC, P.S.
WILLIAM N. CLARK, P.E., P.S.
THOMAS J. KING, P.S.
DOMINIC A. MARTUCCIO, P.E., P.S.
PAUL A. MILLER, P.S.

June 7, 1995

Scott Klingensmith
Environmental Resources, Inc.
P. O. Box 276
Westerville, Ohio 43081

also to Stan Evans @ Beaver

EXHIBIT #11 Defendant

Re: **Canton Drop Forge Contract Documents for the Removal and Bioremediation of the Sludge Lining Lagoons #1 and #2**

Dear Scott:

Enclosed you will find two (2) copies of the contract documents for Canton Drop Forge Contract No. 95-2. It should be noted that the three (3) page attachment shall be considered part of the contract. The following series of events are required to fully execute the contract:

1. Complete and sign the contract documents (2 copies). The contract cost should only include work payable by Canton Drop Forge to The Critter Company. A separate contract between Canton Drop Forge and Beaver Excavating must be signed for Beaver's Services. This will result in two (2) purchase orders which will total Critter's estimated cost to complete the project.

2. Initial and date the attachment (2 copies) to indicate acceptance.

3. Return two (2) copies of Contract 95-2 and the attachments to Gene Hill at Hammontree & Associates, Limited by June 13, 1995.

4. Include with the contract submittal two (2) copies of workman's compensation insurance and general liability insurance.

5. Canton Drop Forge will then execute and return one (1) copy of Contract 95-2 and the attachment to The Critter Company.

6. The schedule for completion of the project will begin five (5) days after Canton Drop Forge has signed the contract.

Respectfully,

HAMMONTREE & ASSOCIATES, LIMITED

Gene G. Hill

Gene G. Hill, E.I.T., M.S.

Enclosure

cc: Beaver Excavating
Canton Drop Forge

wklingen

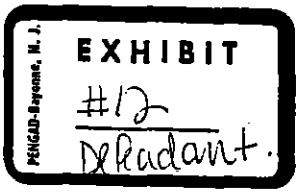
SH

THE CRITTER COMPANY

Biological Remediation of Hydrocarbons

6890 E. Sunrise Drive #120-10 Tucson, Arizona (520) 299-9808

June 9, 1995



Mr. Gene G. Hill
Hammontree and Associates, Limited
Treemore Building
5233 Stoneham Road
North Canton, Ohio 44720

Dear Gene:

Enclosed are the executed contracts. Included is a certificate of insurance for our affiliate, Paradigm Environmental Services, Inc. You will note that The Critter Company is named at the bottom under "Description of Operations". I notice that this will expire June 30, 1995, and we will provide an updated document to you at that time.

With respect to Ohio workman's compensation, Scott Klingensmith is the only resident of Ohio and has sent that certificate to you directly. The rest of the workers will be from Arizona and Kentucky and accordingly are not required to have the coverage in Ohio.

As I am leaving for Ohio in the next few days, please send all correspondence to Scott Klingensmith. I will also be checking with him and my office here for messages.

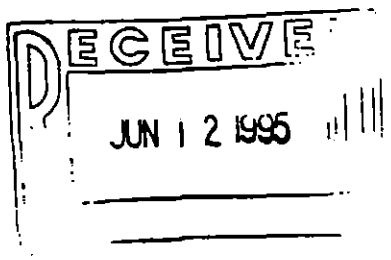
I notice in paragraph 6 of your cover letter dated June 7,m 1995 to Scott Klingensmith the word "completion" when I think you meant "commencement"! In any case we are looking forward to starting in the near future.

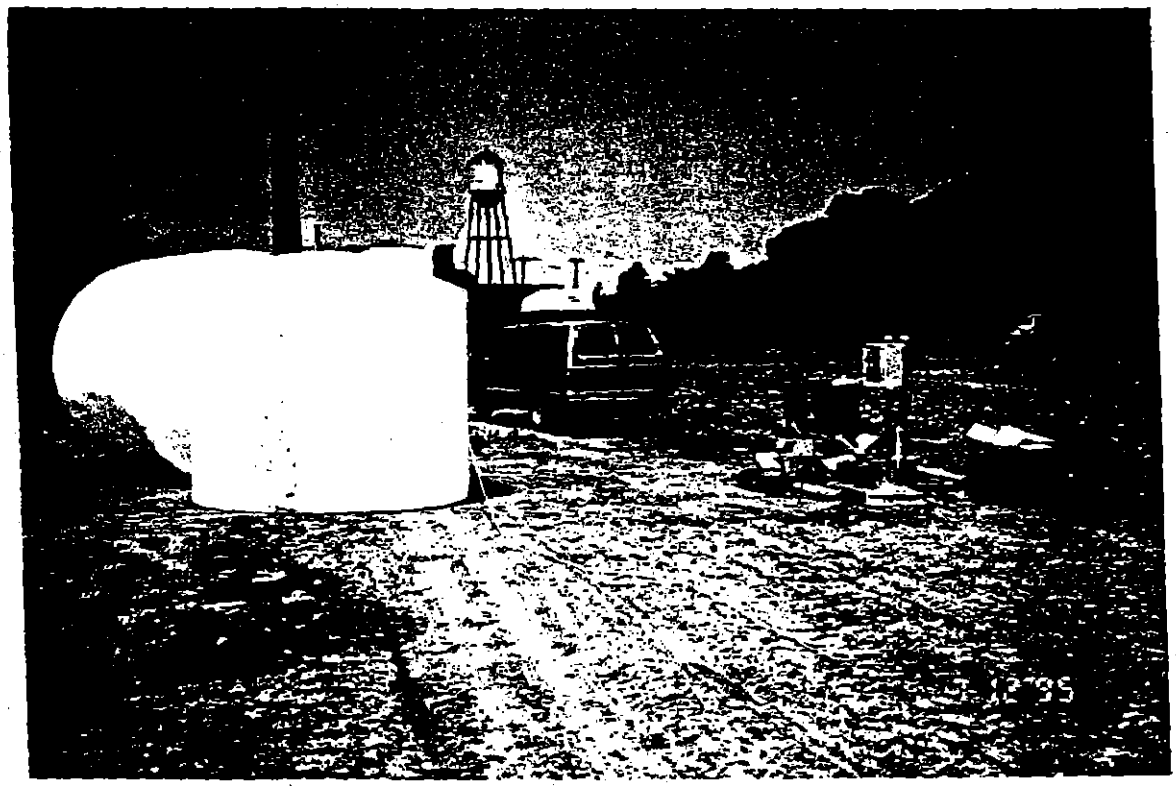
Sincerely,

Jeremy W. Coon

Jeremy W. Coon, President

CDF003825





THE CRITTER COMPANY
Biological Remediation of Hydrocarbons

6890 E. Sunrise Drive #120-10 Tucson, Arizona 85715 (520) 299-9808

MEMORANDUM

To: Gene Hill

From: Jerry Coon

Date: September 20, 1995

Subject: Change Orders

1. Here are the requested changes we initially discussed in you office. We are again addressing the soil as one issue and the higher contaminant levels as the other. I have outlined two payment options. If you have other ones to suggest, please call me.

2. The money to be received upon execution of the changes reflects greatly increased costs to prepare for the project. I have had to alter my technique considerably from what I had initially planned on. I really have to treat what is in the cell as opposed to what we thought was in the cell. If we were to terminate the project at this time, I would anticipate preparing a statement for approximately $38,000 for work performed to date. Option 2 should be the most attractive as it closely ties our performance with our pay. Either is acceptable to me

3. Regarding the soil aeration, this Saturday we will try a "Bog Harrow" which will be delivered to the site from Kentucky. I am unfamiliar with this, as is Stan Evans, but I am told it will aerate to a depth of 18 inches and be impervious to the scrap metal which came from Lagoon #1. The Brown Bear aerator which we used is outstanding but is very expensive. Let's see how the Bog Harrow works and make a decision at that time.

4. We are experiencing difficulty in getting paid for work done to date. I know our attorneys have discussed this however a sixty day pay period on top of the lengthy bioremediation process is far excessive and needs to be changed. This is not part of their production process, is not classified as Cost of Goods Sold, and the money is set aside in escrow. Under normal conditions, this should be released immediately when the work is completed.

5. Again, call if you have some input or need clarification on these issues.

CC: Scott Klingensmith

See Scott K LTR dtd 1/20/95 #5 & #6 Contract June 1 - initialed by J.C

EXHIBIT #16 Defendant

THE CRITTER COMPANY
Biological Remediation of Hydrocarbons

6890 E. Sunrise Drive #120-10 Tucson, Arizona 85715 (520) 299-9808

CHANGE ORDER

PROJECT	Canton Drop Forge 4575 Southway St., S. W. P.O. Box 6902 Canton, Ohio 44706	**CHANGE ORDER NUMBER: BIO-LAG 1-1** **DATE: 09/19/95**
TO ENGINEER:	Hammontree & Associates 5233 Stoneham Rd. North Canton, Ohio 44720	

CONTRACT ORIGINALLY FOR: Bioremediation of oil contaminated soil from Lagoons #1 and #2.

The Contract is changed as follows: Pursuant to section 4.2.3 of the contract, The Critter Company, Inc. is requiring that this change order be approved.

1. Upon discovery by Beaver Excavation that debris was located in Lagoon # 1, and subsequently moved to the Bio Cell and as evidenced by visual observation by The Critter Company and as further evidenced by Mr. Larry Philyaw of Midwest Auger-Aerator (copy of letter attached and photographs taken by him available), the following change order is required.

2. All costs for soil aeration and movement during the bioremediation treatment from Lagoon # 1 shall be paid by Canton Drop Forge. Aeration shall be twice weekly by a method approved by The Critter Company but shall be paid directly by Canton Drop Forge to the contractor/equipment operator. As aeration is essential to a bioremediation project of this high contaminant level, aeration shall commence as soon as possible upon execution of this change order.

ACCEPTED BY:

Canton Drop Forge	Hammontree & Associates	The Critter Company
By: Date:	By: Date:	By: Date: 9/20/95

CDF003830

SOIL AERATION (TILLING) WAS INCLUDED IN THE BID BUT ORIGINALLY BID - NOW NECESSARY TO SEPARATE IT AND INCREASE TREATMENT COST

THE CRITTER COMPANY
Biological Remediation of Hydrocarbons

6890 E. Sunrise Drive #120-10 Tucson, Arizona 85715 (520) 299-9808

CHANGE ORDER

PROJECT	Canton Drop Forge 4575 Southway St., S. W. P.O. Box 6902 Canton, Ohio 44706	**CHANGE ORDER NUMBER: BIO-LAG 1-2** **DATE: 09/20/95**
TO ENGINEER:	Hammontree & Associates 5233 Stoneham Rd. North Canton, Ohio 44720	

CONTRACT ORIGINALLY FOR: Bioremediation of oil contaminated soil from Lagoons #1 and #2.

The Contract is changed as follows: Pursuant to section 4.2.3 of the contract, The Critter Company, Inc. is requiring that this change order be approved.

1. Upon confirmation from Hammontree & Associates, LTD, contamination levels of the material from Lagoon # 1 were on average three times the levels reported to The Critter Company (TCC) in analytical reports prepared by Hammontree & Associates, LTD. (Hammontree) prior to TCC bidding this project. Due to the extremely high contamination levels, TCC requires that the price to continue treating the 3000 cubic yards in the Bio-Cell be increased to $26 per cubic yard.

2. Due to the high contamination levels in the Bio-Cell, TCC cannot be responsible for completing this project in two years. However, TCC will continue to treat the soil in the Bio-Cell until target levels are reached.

3. This change order is only for the 3,000 cubic yards in the Bio-Cell and is contingent upon acceptance of Change Order #BIO-LAG 1-1 and #BIO-LAG 1-2.

4. TCC has and will continue to manufacture microbes and treat the Bio-Cell while these change orders are reviewed and approved.

CDF003831

ORIGINAL: $12.00/CY x 3000 CY = $36,000

REVISED: $26.00/CY x 3000 CY = $78,000

217% INCREASE!

(The total effect will likely be a 300 Month [illegible])

WHY SHE PAYMENT SCHEDULE CHANGE?

PAYMENT SCHEDULE

One of the following payment schedule Options is required due to the increase in contamination levels resulting in anticipated increases in clean-up time, increases in production and labor costs and increases in research and development required to handle the difficulty of the contaminant and the site.

OPTION 1.

1. $4,800 (Billed July 26, 1995) to be paid immediately.
2. $21,000 due upon acceptance of this change order.
3. Three monthly payments of $7,000 due October 30, 1995, November 30, 1995 and December 30, 1995.
4. Balance due of $36,000 when levels of contamination reach target levels as specified in Bid Specifications. (Net 20 days)

OPTION 2.

1. $4,800 (Billed July 26, 1995) to be paid immediately.
2. $25,000 due upon acceptance of this change order.
3. 40% of balance (Lagoon #1 only) due when contamination levels have dropped to 25% of original levels. Net 20 days.
4. 25% of balance (Lagoon #1 only) when contamination levels have dropped to 50% of original levels. Net 20 days.
5. 25% of balance (Lagoon #1 only) when contamination levels have dropped to 75% of original levels. Net 20 days.
5. Remainder of balance (Lagoon #1 only) due when contamination levels have reached target levels. Net 20 days.

EXPIRATION DATE: September 30, 1995

As time is of the essence to continue treatment prior to colder temperatures, should this change order not be executed by the expiration date, TCC will submit a statement for work performed to date pursuant to Ohio Statutes.

ACCEPTED BY:

Canton Drop Forge	Hammontree & Associates	The Critter Company
By:	By:	By: Jerry Com Pres.
Date:	Date:	Date: 9/20/95

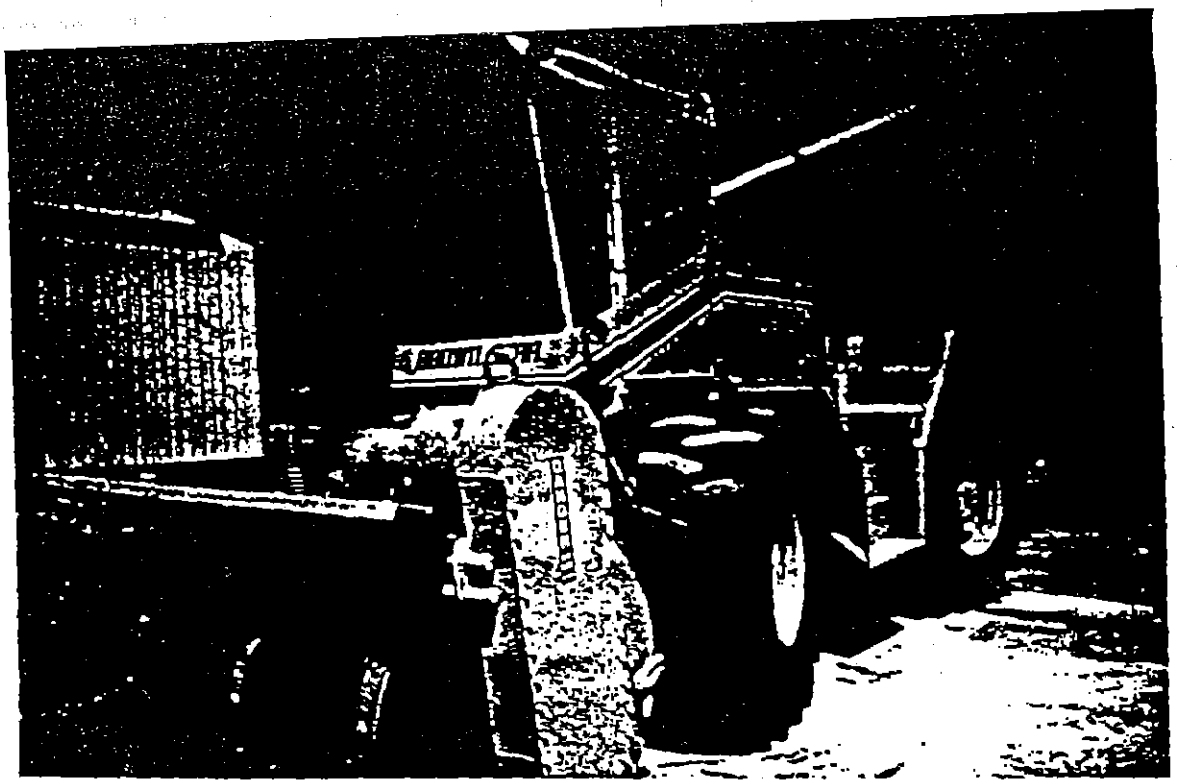
Our normal option to purchase the machine is to allow 100% of the rentals paid in, to apply to the purchase price of $79,500, if the unit is purchased within the first 30 days of the rental contract, or 90% if purchased within 90 days. Of course, if the purchase option is exercised, the $10,000 damage repair deposit would also be applied to the selling price.

As for giving you some idea of what various costs might be, a set of 28.1-26 L1 tires will run about $5000, an auger screw rebuild (wear plates, carbide teeth, hard facing, welding, etc.),will run $2000-3000, auger bearings about $1000-2000, and auger shaft replacement $2000-3000. You may or may not have to bear these costs, as mentioned above, but I think I would allow something, especially enough for a set of tires and screw rebuild.

If you need any further information, please don't hesitate to call.

Sincerely,

Larry Philyaw
MIDWEST AUGER-AERATOR



BROWN BEAR I

STOCK # 1062

$79,500

225 HP Brown Bear I w/10' Auger w/carbide cutting teeth. JD 6466A Diesel Engine. ROPS Cab w/Heater and Air Conditioning. Four Wheel Drive, Four Wheel Steering, with coordinated, crab & front-wheel-only steering modes. 28.1-26 L1 Forestry Tires, 75-80% Tread Remaining.

Machine completely rebuilt approximately 1500 hours ago, including hydraulic pumps & motors, differentials & axles. Recently gone through in shop, all systems checked, tested, & serviced or repaired as needed.

Available August 15, 1995. 30 day 50/50 warranty. Rent-purchase plan available.

RENTAL RATES: $12,500/MO. 1 MO. MIN.
10,000/MO. 3 MO. MIN.
8,500/MO. 6 MO. MIN.

AAA

MIDWEST AUGER-AERATOR

1-800-3294

CDF003834

R. JAMES HAMMONTREE, P.E., P.S.
BRUCE M. BAIR, P.E., P.S.
LAWRENCE D. PHILLIPS, P.E., P.S.
CHARLES F. HAMMONTREE, P.E., P.S.
RONALD P. DOHY, P.S.
GARY L. TOUSSANT, P.S.
JOSE E. TOLEDO, P.E., P.S.
RICHARD R. COOK, P.E., P.S.
JAMES C. SOLLISON, P.E., P.S.
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HAMMONTREE & ASSOCIATES, LIMITED
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PAUL A. TOMIC, P.S.
WILLIAM N. CLARK, P.E., P.S.
THOMAS J. KING, P.S.
DOMINIC A. MARTUCCIO, P.E., P.S.
PAUL K. MILLER, P.S.
DAVID T. MILLER, P.S.

October 2, 1995

The Critter Company
6890 East Sunrise Drive #120-10
Tucson, Arizona 85715

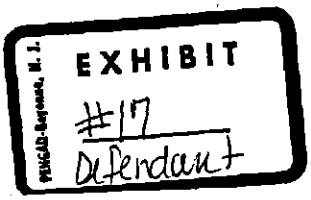
Attention: Jerry Coon

Subject: **Change Order requests**
dated September 20, 1995
Change Order Number: BIO-LAG 1-1
Change Order Number: BIO-LAG 1-2
Payment Schedule

Prior to responding to your change order request I will review the current contract agreement. The Critter Company (TCC) and Canton Drop Forge (CDF) entered into in agreement in June of 1995, for bioremediation services. Under this contract TCC's responsibilities included the following:

1. Treatability study
2. Bioengineering services
3. All site preparation necessary for treatment; including coordination of bio-cell construction.
4. Labor and material for inoculating the material to be treated.
5. All earthmoving and watering during the duration of the project, including weekly or bi-weekly tilling of bio-cell material.
6. Reports and documentation procedure.
7. Permitting

w:\rene\letter\coon2



CDF and Hammontree & Associates, Ltd. (H&A) are responsible for:

1. Access to the treatment area (CDF).
2. Continuous water supply to the treatment area (CDF).
3. Soil sampling and testing including beginning, intermediate, and confirmation samples upon completion of the project (H&A)

We have reviewed and discussed the change order request with CDF. The following sections will address each item in your September 9, 1995 letter in order.

CHANGE ORDER - BIO-LAG 1-1, ITEM 1

The occurrence of scrap metal and debris at a forge company should have been expected and should not come as a surprise. TCC personnel were able to visit the CDF property including Lagoon #1 and the bio-cell site. In fact CDF personnel drew attention to the probable presence of such material to TCC.

TCC is considered the expert in determining the suitability of materials for bioremediation. As indicated by TCC, two factors which determine the suitability are the biodegradability of a material and the physical make up of a material. The investigation of these items was TCC's responsibility.

Based on these items, **CHANGE ORDER BIO-LAG 1-1, ITEM 1** is rejected.

CHANGE ORDER - BIO-LAG 1-1, ITEM 2

In the January 6, 1995, letter from TCC to H&A it is clear that TCC intended to be the party responsible for all earthmoving and watering during the project. In the report title "Lagoon #1 Sludge Disposal/Treatment Options", page 4 lists tilling of the bio-cell as part of TCC's responsibilities. This statement was included in the report as a result of your January 6, 1995 letter. The Critter Company received a copy of this report and was aware of each parties responsibilities during the project.

An April 28, 1995 Critter Company's letter also acknowledges TCC as the party responsible for tilling of the bio-cell.

Items 5 and 6 in the April 28, 1995 Critter Company letter indicate TCC's acceptance of performance based payments and the need for a mutually agreeable payment schedule. As requested by TCC and agreed to by Canton Drop Forge, payments based on performance were used in lieu of performance bond which you could not or would not provide.

Direct payment to an "aeration contractor" is not acceptable. The tilling is included in the bid price of $12/c.y. as listed on page 13 of the contract.

CHANGE ORDER: BIO-LAG 1-2, ITEM 1

In the January 6, 1995, letter from TCC it is clear that TCC will be responsible for the treatability study required for the project. Nowhere in that letter does it indicate that Hammontree & Associates or Canton Drop Forge was responsible for determining treatability. Hammontree & Associates is responsible for beginning, intermediate, and confirmation samples. Hammontree did retrieve and test materials lining Lagoon #1 as part of the preparation of "Lagoon #1 Sludge Disposal Treatment Options". As indicated on page 1 of that report the intent of that investigation was to determine whether the material was hazardous and/or biodegradable. This goal was met. Nowhere in this report does it indicate that the samples tested were representative of the average material. During sample retrieval attempts were made to pass through the bulk of the obviously contaminated material and into a "clean" layer to determine the physical limits of contamination and aid in treatment quantity estimation.

TCC was given samples of both the lining material and the material from the center of the sludge layer. TCC did not test these samples for TPH.

It was TCC's responsibility to verify contamination levels. Page 4 of "Lagoon #1 Sludge Disposal/Treatment Options" does indicate that Hammontree & Associates is to sample as required by TCC during remediation, however, Page 1 of Contract 95-2A states that initial contamination concentrations shall be established by five (5) random samples from the bio-cell material.

CHANGE ORDER: BIO-LAG 1-2, ITEM 2

The time frame shall be as stated in the contract documents. Altering the completion of work date is not acceptable to CDF.

CHANGE ORDER: BIO-LAG 1-2, ITEM 3

No comment required since Items 1 and 2 are not acceptable to CDF.

CHANGE ORDER: BIO-LAG 1-2, ITEM 4

No comment required. TCC is expected to conform to the contract documents.

PAYMENT SCHEDULE

There is no justification for altering the payment schedule. The payment schedule in Contract 95-2A is very clear and mutually agreed upon. This type of payment schedule was requested by TCC in lieu of a performance bond. The only payments that fall outside of this schedule will be for work that is not covered in the contract document.

Also, I am requesting that five feet of clearance be maintained between the bio-cell material and the existing monitoring well. This was agreed to in preliminary bioremediation discussions.

Sincerely,

HAMMONTREE & ASSOCIATES, LIMITED

Gene G. Hill, E.I.T., M.S.

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CANTON DROP FORGE

February 22, 1996

Mr. Jerry Coon
6890 E. Sunrise Drive. #120-10
Tucson. Arizona 85715

Dear Mr. Coon:

With the spring season approaching. I would appreciate you advising me of your anticipated schedule for bioremediation treatments and tilling. Based on Scott Klingensmith's prior communication I have been planning on an April start date with treatments and tilling weekly or bi-weekly thereafter.

I am also interested in your plan for inoculations of the 200-300 cubic yards of material close to lagoon #1, your plan for bulking or draining the low areas of the bio-cell, and your plan for the hydrogen peroxide. If you do not anticipate using the hydrogen peroxide I would like to have the tanks and liquid removed because of the safety issues related to concentrated hydrogen peroxide.

Through the year, please let me know when you or your employees arrive on site and what is being accomplished. Call me if I can assist you in arranging for the spring startup.

Sincerely,

Keith J. Houseknecht

Keith J. Houseknecht

EXHIBIT #18 Defendant

CDF003839

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